APPENDICES FOR THE FINAL REPORT

EVALUATION OF THE NETWORKS OF CENTRES OF EXCELLENCE PROGRAM

Prepared for
The NCE Program Evaluation Committee

Prepared by
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APPENDIX A

DETAILED TABLES FROM THE SURVEY OF RESEARCHERS AT RENEWED NETWORKS

Sector	N
Medical Networks	= 104
Electronic Networks	= 74
Other Networks	= 29
Total	207

Note: Unless otherwise stated, data in exhibits that show only overall responses did not display any striking differences by sector

Exhibit RR.2: Renewed Networks' Researchers – Employment of respondents

University	85%
Private sector	2%
Hospital	7%
Government	2%
Other	4%

Exhibit RR.3: Renewed Networks' Researchers – Years as an independent researcher

Average = 17 years
Median = 16 years
Range = 1 - 45 years

Exhibit RR.4: Renewed Networks' Researchers – approximate annual research funding: average per investigator

In the 5 years prior to joining your network	Since you joined your network	Note: a = b+c
$160,200	$236,000 (+47%)[1]	a) Approximate annual average total research funding from all sources.
N/A	$58,500	b) Portion of total that is from your network
$160,200	$183,200	c) Portion of total from non-NCE funding sources

[1] The total (a) is slightly different from the sum of b and c because of minor problems with missing data and incorrect addition by respondents. Percentage change not adjusted for inflation.

Exhibit RR.5: Renewed Networks' Researchers – proportional split between fundamental and applied research funding: average per investigator

	In the 5 years prior to joining the network	Since joining the network
Fundamental	65%	51%
Applied	35%	49%

Exhibit RR.6: Renewed Networks' Researchers – influence of participation in the network on changes to funding and effort: % of respondents

	Major influence	Minor influence	No influence	Don't know	Not applicable (no significant change)
Influence on total funding	57	26	5	0	11
Influence on balance of effort	43	28	12	0	17

Exhibit RR.7a Renewed Networks' Researchers – Impact* of network features on research: % of respondents

	Neg. Values	0	+1	+2	+3	+4	+5	Avg. Value
Impact of the extra research funding you received through your network	0	7	8	9	24	17	37	3.48
Impact of your network's networking and collaboration	0	6	7	15	26	18	28	3.28[1]
Impact of your network's management	10	26	11	19	17	10	8	1.65
Impact of interactions with external sources (e.g., industry, government, hospitals)	1	16	19	16	20	12	18	2.47[2]
Impact of your network's support for training highly qualified people	1	14	10	19	18	16	23	2.79

* Where -5=Major negative impact; 0=No impact; and +5=Major positive impact

[1] Avg. value Medical=3.51; Electronic=3.12; Other=2.89

[2] Avg. value Medical=2.05; Electronic=2.90; Other=2.31

Exhibit RR.7b Renewed Networks' Researchers – Of the positive impact – if any – of the network on research, rough percentage due to the extra research funding, versus percentage due to other factors such as networking, management, and training: average value

54%	Due to extra research funding*
46%	Due to other factors

* The distribution is trimodal, with peaks at about 20% (smallest peak), 50% (largest peak), and 80% (second largest peak).

Exhibit RR.8 Renewed Networks' Researchers – Is your NCE research different from the type of research you were doing prior to joining the network: % of respondents

	Overall	Medical	Electronic	Other
Yes	67	66	69	66
No	33	34	31	34

If yes, how?	**% of those reporting changes**			
	Overall	**Medical**	**Electronic**	**Other**
The NCE work is in a new field of research for me, or addressed new topics, or tried new approaches	67	77	56	58
The NCE work involves important links to other disciplines	49	62	42	21
The NCE work involves important new collaborations	82	93	76	58
The NCE work is more oriented towards needs of industry	73	73	72	74
The NCE work is more oriented towards needs of government	5	4	6	5
The NCE work is more oriented towards health care or social needs	28	48	12	0
Other	6	6	4	11

Exhibit RR.9 Renewed Networks' Researchers – Has your participation in the network had any impact on your general research program

	Overall	Medical	Electronic	Other
Yes	75	74	76	76
No	25	25	24	24
Not applicable: All my work is on NCE research	1	1	0	0

If yes, how?	**% of those reporting changes**			
	Overall	**Medical**	**Electronic**	**Other**
Because of NCE, I entered a new field of research in my other work, or addressed new topics or tried new approaches.	63	69	55	67
My non-NCE work involves important links to other disciplines facilitated by the network	48	55	40	43
My non-NCE work involves important new collaborations created through the network	61	65	55	62
My non-NCE work is more oriented towards industry needs because of the network	45	36	58	43
My non-NCE work is more oriented towards government needs because of the network	5	4	4	10
My non-NCE work is more oriented towards health care or social needs because of the network	16	26	8	0
Other; what?	7	7	7	5

Exhibit RR.10a: Renewed Networks' Researchers – Has the NCE changed your attitude about collaborative research: % of respondents

	Overall	Medical	Electronic	Other
More positive attitude now	49	52	43	55
No change in attitude	48	44	55	45
More negative attitude now	2	4	1	0

Exhibit RR.10b: Renewed Networks' Researchers – Has the NCE changed your attitude about applied research: % of respondents

	Overall	Medical	Electronic	Other
More positive attitude now	49	57	40	45
No change in attitude	49	39	60	55
More negative attitude now	3	4	1	0

Exhibit RR.11: Renewed Networks' Researchers – How many people work on the research team*: average full-time equivalents per respondent

	In the 5 years prior to joining your network	Since joining your network
Senior investigators at your university (Including yourself)	1.80	2.68
Senior investigators at other universities	0.81	2.35
Senior industry investigators (including yourself, if appropriate)	0.36	1.14
Senior investigators from organizations such as government and hospitals (including yourself, if appropriate)	0.27	0.60
Postdoctoral fellows	1.21	2.18
Graduate students	3.88	5.99
Other research assistants or associates	0.60	1.52
Technicians	0.91	1.45
Total	**9.84**	**17.91 (+82%)**

* The source of funding is irrelevant. Investigators outside the lab are included if they are making a significant contribution to the network.

Exhibit RR.12a: Renewed Networks' Researchers – Approximately what proportion of your research has been multidisciplinary in nature? (This could be either through your own work in more than one discipline, or through being part of a multi-disciplinary team.): average per respondent

	In your NCE research	In your non-NCE research
Since you joined your network	54%	48%
In the same period before you joined your network	N/A	40%

Exhibit RR.12b: Renewed Networks' Researchers – If there has been a change in the degree of multidisciplinarity over time, what influence did your network have?: % of respondents

	In the NCE Work				
	Major influence	Minor influence	No influence	Don't know	Not applicable – no change
Overall	43	23	13	2	19
Medical	57	19	12	0	13
Electronic	24	29	21	3	22
Other	36	23	0	5	36

	In Non-NCE Work				
	Major influence	Minor influence	No influence	Don't know	Not applicable – no change
Overall	21	34	25	2	19
Medical	31	36	19	0	14
Electronic	7	35	37	4	18
Other	19	24	14	5	38

Exhibit RR.13: Renewed Networks' Researchers – Differences in the scientific merit of network research, compared to that supported by non-NCE sources: average value per respondent

	World-class	Excellent	Good	Fair	Poor	TOTAL
Network research	28%[1]	46%	22%	5%	0%	100%
Non-NCE research	31%[2]	43%	24%	3%	0%	100%

[1] 45% of respondents answered zero

[2] 30% of respondents answered zero

Exhibit R14: Renewed Networks' Researchers – Difference in degree of scientific risk* of network research projects compared to those supported by non-NCE funding sources: % of respondents

	Overall	Medical	Electronic	Other
The network supports relatively more risky, original research than non-NCE sources do	31	41	15	35
The network supports relatively more conservative, traditional research than non-NCE sources do	20	9	36	17
There is not much difference in terms of the degree of risk	45	49	43	38
Don't know	5	2	7	10

* Where "high risk" implies the work is more speculative or the outcome is less certain

Exhibit RR.15a: Renewed Networks' Researchers – Percent of respondents who left a position in another country to accept a research position in Canada

Overall	10
Medical	10
Electronic	12
Other	4

Exhibit R15b: Renewed Networks' Researchers – Importance of existence of the network in making the decision to move to Canada: % of respondents

	Overall
Very important	33
Moderately important	14
Slightly important	0
Not important	52
Don't know	0

Exhibit R16a: Renewed Networks' Researchers – Percent of respondents who seriously considered accepting a research position outside Canada since 1989 (or since moved to Canada, if applicable)

Overall	37
Medical	43
Electronic	37
Other	18

Exhibit RR.16b: Renewed Networks' Researchers – Importance of the existence of the network in making the decision to stay in Canada: % of respondents

	Overall
Very important	18
Moderately important	42
Slightly important	21
Not important	15
Don't know	4

Exhibit RR.17: Renewed Networks' Researchers – Impact on the type of training provided to younger researchers compared to the training for similar researchers supported through non-NCE sources: % of respondents

	Training for Postdoctoral fellows				
Type of Impact	**NCE provides poorer training**	**NCE training is about the same**	**NCE provides better training**	**Don't Know**	**N/A***
Overall quality of scientific training	2	50	29[1]	8	10
Exposure to users in industry, government, health care	1	16	63[2]	10	10
Involvement in research project planning and management	3	53	21	11	10
Experience with state-of-the-art equipment	3	44	33[3]	9	11
Making professional contacts and networking	2	13	66[4]	9	10
Impact on prestige and career	3	37	36	13	10
Ability to find a job	2	33	35	19	10

* N/A means the respondent said the network provided no training

[1] Medical – 33%; Electronic – 20%; Other – 36%

[2] Medical – 76%; Electronic – 42%; Other – 56%

[3] Medical – 39%; Electronic – 18%; Other – 44%

[4] Medical – 80%; Electronic – 42%; Other – 65%

	Training for Graduate Students				
Type of Impact	**NCE provides poorer training**	**NCE training is about the same**	**NCE provides better training**	**Don't Know**	**N/A***
Overall quality of scientific training	1	58	34	5	2
Exposure to users in industry, government, health care	1	21	70	5	3
Involvement in research project planning and management	4	60	26[1]	8	3
Experience with state-of-the-art equipment	2	50	40	6	3
Making professional contacts and networking	1	20	72	5	3
Impact on prestige and career	1	47	40	10	3
Ability to find a job	1	40	40[2]	17	3

* N/A means the respondent said the network provided no training

[1] Medical – 14%; Electronic – 41%; Other – 28%

[2] Medical – 31%; Electronic – 47%; Other – 52%

Exhibit RR.18: Renewed Networks' Researchers – Does the network have an effective management system: % of respondents

	Yes	Partial success	No	Don't know
Selecting themes that cover the major fields necessary to achieve success in the network's overall goals	67	24	3	6
Selecting individual research projects that fit into the network themes	57	34	3	6
Allocating or changing support to individual projects	52	30	11	7
Identifying research results with potential for commercial or social benefits	56	30	7	7
Communicating NCE activities within the network	77	19	3	1
Communicating NCE activities outside the network	57	26	4	13

Exhibit RR.20: Renewed Networks' Researchers – Collaboration and networking with other parties since joining the network, compared to prior to joining the network: % of respondents

Collaborated with	Collaboration for Helping Plan Your Research							
	None	Much Less	Less	About the Same	More	Much More	Don't Know	N/A
University researchers	0	0	1	34	40	21	0	5
Industry representatives	0	0	1	33	34	17	0	16
Government representatives	1	1	0	47	10	4	1	36
Hospital or health care representatives	2	1	0	32	9	2	1	54

Collaborated with	Collaboration for Helping to Carry Out Your Research							
	None	Much Less	Less	About the Same	More	Much More	Don't Know	N/A
University researchers	0	0	1	37	41	20	0	2
Industry representatives	0	0	0	38	34	16	0	11
Government representatives	1	1	1	51	7	5	1	34
Hospital or health care representatives	2	0	1	33	10	2	2	51

Collaborated with	Collaboration for Helping to Apply Your Results							
	None	Much Less	Less	About the Same	More	Much More	Don't Know	N/A
University researchers	0	1	0	48	33	9	0	9
Industry representatives	0	0	2	31	33	21	0	13
Government representatives	2	1	1	50	6	5	1	36
Hospital or health care representatives	2	0	1	30	10	3	2	54

Exhibit RR.21: Renewed Networks' Researchers – Change over time in the amount of collaboration in network research: % of respondents

	Decreased over time	About the same	Increased over time	Don't know
With university researchers	3	27	68	1
With industry	2	27	67	4
With government	7	60	20	13
With hospital or health care representatives	4	47	22*	28
With others	4	2	4	90

*Medical – 29; Electronic – 18; Other – 0

Exhibit RR.22: Renewed Networks' Researchers – Importance of the influence of the network, versus other factors, on the amount of networking and collaboration undertaken recently: % of respondents

	Overall	Medical	Electronic	Other
The network was the most important factor	46	46	40	59
The network and other factors were about equal in importance	41	42	47	24
Other factors were more important than the network	7	5	10	7
Not applicable: the extent of my networking and collaboration has not changed	5	7	4	3
Don't know	1	0	0	7

Exhibit RR.24a: Renewed Networks' Researchers –Type of practical applications likely from network research: % of respondents

	Overall	Medical	Electronic	Other
No practical applications are likely	1	0	1	0
There will likely be application to:				
Policies or regulations of government agencies	9	9	3	29
Policies or regulations of hospitals or other health care organizations (e.g., NGOs)	4	8	1	0
Policies or regulations of industry	9	5	8	29
Disease/injury diagnosis, treatment, or identification of risk factors	41	78	5	4
Social impacts such as improved education, care of the elderly, quality of life, better environment	14	19	10	11
The R&D topics addressed by private sector companies	62	59	59	54
The R&D capability of private sector companies	52	44	64	54
Applications for patents, licences, or other intellectual property protection	67	77	57	54
Further R&D investments being made by the private sector or the investment community.	63	61	66	57
New products, processes, or services being actively developed by or for industry	76	72	81	79
New jobs being created, or jobs being retained that would have been lost otherwise	56	62	54	36
Other	3	4	1	11

Exhibit RR.24b: Time period in which these applications are likely to occur: % of respondents

	Overall	Medical	Electronic	Other
Some have already occurred	46	47	48	41
In the next 5 years	63	63	64	59
6-10 years from now	11	11	11	14
More than 10 years from now	1	1	0	0
Don't Know	2	1	0	7

Note: multiple responses possible.

Exhibit RR.25: Renewed Networks' Researchers – How well informed have researchers been about changes to program goals and policies for Phase II: % of respondents

Very well informed	38
Moderately well informed	42
Not very well informed	15
Not at all informed	6

Exhibit RR.26: Renewed Networks' Researchers – Impacts of the new Phase II goals and policies: % of respondents

	Higher	No change due to revisions	Lower	Don't Know
Your satisfaction with the NCE program's goals and policies	24[1]	40	22[2]	14
Your satisfaction with your network's goals and policies	26	39	22[3]	13
Your willingness to stay in your network	20	52	15	12
The proportion of your total research focused on long-term fundamental science	10	46	31	13
The proportion of your total research focused on research of interest to industry, government, or health care	45	39	1	15
Other. What?	2	0	1	0

[1] Medical – 19%; Electronic – 30%; Other – 29%

[2] Medical – 32%; Electronic – 13%; Other – 7%

[3] Medical – 29%; Electronic – 17%; Other – 7%

No Striking differences by sector for other impacts.

Exhibit RR.27: Renewed Networks' Researchers – Degree to which the NCE program and your network are achieving the Phase II goals: % of respondents

Goals	Success of NCE Program				
	Not at all successful	Slightly successful	Moderately successful	Very successful	Don't Know
Stimulate excellent fundamental and applied research important to Canada's economic development	0	6	27	32	36
Develop and retain excellent people in areas important to Canada	1	6	23	27	43
Manage multidisciplinary, multisectoral, integrated research programs	0	8	21	29	42
Accelerate transfer of results within and outside the network, and use them for economic and social development	0	7	26	23	44

Goals	Success of Your Network				
	Not at all successful	Slightly successful	Moderately successful	Very successful	Don't Know
Stimulate excellent fundamental and applied research important to Canada's economic development	1	7	32	56[1]	4
Develop and retain excellent people in areas important to Canada	5	12	27	58[2]	8
Manage multidisciplinary, multisectoral, integrated research programs	4	11	29	46[3]	9
Accelerate transfer of results within and outside the network, and use them for economic and social development	3	11	36	42[4]	8

[1] Medical-47; Electronic-63; Other-71

[2] Medical-41; Electronic-62; Other-64

[3] Medical-51; Electronic-28; Other-50

[4] Medical-39; Electronic-32; Other-58

Exhibit RR.28: Renewed Networks' Researchers –Appropriateness of the Phase II NCE goals for the program as a whole and individual network: % of respondents

	Yes	No	Don't know
For the program	61	6	33
For your network	76[1]	9	14

[1] Medical-73; Electronic-78; Other-82

Exhibit RR.29: Renewed Networks' Researchers – Overall degree of satisfaction with the NCE program and your network: % of respondents

	Very satisfied	Moderately satisfied	Not very satisfied	Not at all satisfied	Don't Know
With the NCE program	40[1]	34	7	2	17
With your network	60	32	6	4	0

[1] Medical – 35; Electronic – 40; Other – 60

Exhibit RR.32: Renewed Networks' Researchers –If the current total federal budget for university research support remains constant, would you prefer the allocation to the NCE program to change: % of respondents

	Overall	Medical	Electronic	Other
I would prefer more research support through the NCE, and correspondingly less through other federal funding sources. How much more to NCE?	17[1]	20	19	19
I would prefer the allocation among programs to remain approximately the same.	60	59	71	68
I would prefer less research support through the NCE, and correspondingly more through other federal funding sources. How much less to NCE?	16[2]	22	11	14
Don't know	7	9	8	4

[1] On average these respondents would prefer 36% more funding to NCE.

[2] On average these respondents would prefer 64% less funding to NCE

APPENDIX B

DETAILED TABLES FROM THE SURVEY OF RESEARCHERS AT NEW NETWORKS
(THEME LEADERS ONLY)

N = 13

Exhibit RN.2: Researchers at New Networks – Are you currently employed primarily by:

A university	85%
A private sector company	0%
A hospital	0%
A government organization	8%
Other	8%

Exhibit RN.3: Researchers at New Networks – For how long have you been an active independent researcher

Average	21 years
Median	22 years
Range	4 - 40 years

Exhibit RN.4: Researchers at New Networks – On average, roughly what amount of research funding have you been awarded annually?: Average per respondent

In the 5 years prior to joining your network	Since you joined your network	Note: a = b+c
$342,700	$471,500 (+38%)[1]	a) Approximate annual average total research funding from all sources.
$0	$123,100	b) Portion of total that is from your network
$342,700	$328,600	c) Portion of total from non-NCE funding sources

[1] The total (a) is slightly different from the sum of (a) + (b) because of minor problems with missing data. Percentage change not adjusted for inflation.

Exhibit RN.5a: Researchers at New Networks — Impact* on your research of various features of your network

	Neg. Value	0	+1	+2	+3	+4	+5	Avg. Value
Impact of the extra research funding you will receive through your network	0	0	15	23	23	15	23	3.08
Impact of your network's networking and collaboration	0	0	0	8	46	23	23	3.62
Impact of your network's management	8	15	15	8	31	15	8	1.92
Impact of interactions with external sources (e.g., industry, government, hospitals)	0	0	15	8	39	23	15	3.15
Impact of your network's support for training highly qualified people	0	8	8	31	31	8	15	2.69
Other impact. What	0	0	23	0	0	0	0	1.00

* Where -5 = Major negative impact; 0 = No impact; and +5 = Major positive impact.

Exhibit RN.5b: Researchers at New Networks — Of the positive impact — if any — of the network on your research, roughly what percentage will likely be due to the extra research funding, and what percentage will be due to other factors such as networking, management and training?: Average values

Due to extra research funding	44%
Due to other factors	56%[1]

[1] Range 25% - 95%

Exhibit RN.6: Researchers at New Networks — Will your NCE research be different from the type of research you were doing prior to joining the network?: % of respondents

Yes	69
No	31

If yes, in what ways will it be different?: % of those reporting changes

The NCE work is in a new field of research for me, or addressed new topics, or tried new approaches	67
The NCE work involves important links to other disciplines	89
The NCE work involves important new collaborations	100
The NCE work is more oriented towards needs of industry	67
The NCE work is more oriented towards needs of government	11
The NCE work is more oriented towards health care or social needs	22
Other	0

Exhibit RN.7: Researchers at New Networks – How many people work on your research team?: Average full-time equivalents per respondent

	In the 5 years prior to joining your network	Since joining your network
Senior investigators at your university (Including yourself)	2.62	2.85
Senior investigators at other universities	1.36	5.09
Senior industry investigators (including yourself, if appropriate)	1.08	1.50
Senior investigators from organizations such as government and hospitals (including yourself, if appropriate)	1.33	2.00
Postdoctoral fellows	0.64	1.25
Graduate students	6.75	7.00
Other research assistants or associates	3.38	4.25
Technicians	0.85	1.10
Total	**18.01**	**25.04 (+39%)**

The source of funding is irrelevant. Include investigators outside your lab if they are making a significant contribution to your network.

Exhibit RN.8a: Researchers at New Networks – Approximately what proportion of your research has been multidisciplinary in nature? (This could be either through your own work in more than one discipline, or through being part of a multi-disciplinary team.): Average values

	In your NCE research	In your non-NCE research
Since you joined the network (or is likely once the research program is finalised)	77%	68%
In the same period before you joined the network	N/A	60%

Exhibit RN.8b: Researchers at New Networks – If there has been (or likely will be) a change in the degree of multidisciplinarity, what influence has the network had?: % of respondents

	Major influence	Minor influence	No influence	Don't know	Not applicable – no change
For your NCE work	80	10	0	0	10
For your non-NCE work	22	44	22	0	11

Exhibit RN.9: Researchers at New Networks – Is there any difference in terms of the degree of scientific risk of network research projects compared to those supported by non-NCE funding sources?*: % of respondents

The network supports relatively more risky, original research than non-NCE sources do	50
The network supports relatively more conservative, traditional research than non-NCE sources do	25
There is not much difference in terms of the degree of risk	25
Don't know	0

* i.e., where "high risk" implies the work is more speculative or the outcome is less certain

Exhibit RN.10: Researchers at New Networks – Do you think your network has set up an effective management system for the following?: % of respondents

	Yes	Partial success	No	Don't know or too soon
Selecting themes that cover the major fields necessary to achieve success in the network's overall goals	75	25	0	0
Selecting individual research projects that fit into the network themes	42	42	17	0
Allocating or changing support to individual projects	33	0	17	50
Identifying research results with potential for commercial or social benefits	17	17	8	58
Ensuring partners have the receptor capability to understand and use the research results	17	33	0	50
Formally or informally tranferring technology to partners and other users	33	17	0	50
Communicating NCE activities within the network	42	42	17	0
Communicating NCE activities outside the network	33	42	8	17

Exhibit RN.11: Researchers at New Networks – How much collaboration and networking have you had with other parties since joining the network, compared to prior to joining the NCE?: % of respondents

Collaborated with	Collaboration for Helping Plan Your Research							
	None	Much Less	Less	About the Same	More	Much More	Don't Know	N/A
University researchers	0	0	0	23	54	23	0	0
Industry representatives	0	0	0	46	39	8	8	0
Government representatives	0	0	0	46	31	15	8	0
Hospital or health care representatives	0	0	0	23	8	15	8	46

Collaborated with	Collaboration for Helping to Carry Out Your Research							
	None	Much Less	Less	About the Same	More	Much More	Don't Know	N/A
University researchers	0	0	0	23	54	15	8	0
Industry representatives	0	0	0	46	31	8	8	8
Government representatives	0	0	0	54	23	8	8	8
Hospital or health care representatives	0	0	0	9	18	0	9	64

Collaborated with	Collaboration for Helping to Apply Your Results							
	None	Much Less	Less	About the Same	More	Much More	Don't Know	N/A
University researchers	0	0	0	8	46	15	8	23
Industry representatives	0	0	0	15	15	39	15	15
Government representatives	0	0	0	31	8	23	15	23
Hospital or health care representatives	0	0	0	9	9	0	18	64

Exhibit RN.12a: Researchers at New Networks – What kind of practical applications are likely from your network research?: % of respondents

No practical applications are likely	0
There will likely be application to:	
Policies or regulations of government agencies	54
Policies or regulations of hospitals or other health care organizations (e.g., NGOs)	15
Policies or regulations of industry	62
Disease/injury diagnosis, treatment, or identification of risk factors	23
Social impacts such as improved education, care of the elderly, quality of life, environment	54
The R&D topics addressed by private sector companies	62
The R&D capability of private sector companies	46
Applications for patents, licences, or other intellectual property protection	69
Further R&D investments being made by the private sector or the investment community.	77
New products, processes, or services being actively developed by or for industry	69
New jobs being created, or jobs being retained that would have been lost otherwise	54
Other	15

Exhibit RN.12b: Researchers at New Networks – In roughly what time period are these applications likely to occur?: % of respondents

Some have already occurred	23
In the next 5 years	85
6-10 years from now	46
More than 10 years from now	8
Don't Know	0

Exhibit RN.13: Researchers at New Networks – What is your overall degree of satisfaction with the NCE program and your network so far?: % of respondents

	Very satisfied	Moderately satisfied	Not very satisfied	Not at all satisfied	Too soon to tell
With the NCE program	46	39	0	0	15
With your network	62	23	0	8	8

Exhibit RN.16: Researchers at New Networks – If the current total federal budget for university research support remains constant, would you prefer the allocation to the NCE program to change?: % of respondents

I would prefer more research support through the NCE, and correspondingly less through other federal funding sources. How much more to NCE?	31[1]
I would prefer the allocation among programs to remain approximately the same.	39
I would prefer less research support through the NCE, and correspondingly more through other federal funding sources. How much less to NCE?	8
Don't know	23

[1] On average these respondents would prefer 39% more to NCE.

APPENDIX C

DETAILED TABLES FROM THE SURVEY OF RESEARCHERS AT NON-RENEWED NETWORKS

Network	N
CARNET	= 7
CEMAID	12
CNSR	= 8
IBC	= 13
OPEN	= 12
D/K	= 7
Total	59

Exhibit RX.2: Researchers at Non-Renewed Networks – During participation in your network were you employed primarily by: % of respondents

A university	78
A private sector company	2
A hospital	0
A government organization	20
Other	

Exhibit RX.3: Researchers at Non-Renewed Networks – On average, roughly what amount of research funding have you been awarded annually? Only include your portion of any jointly-held grants: Average value per respondent*

In the 5 years prior to joining your network	While you were in the network	After your network terminated	Note: a = b + c*
$194,000	$294,600	$248,100	a) Approximate total annual average research funding from all sources*
N/A	$103,400	$3,400	b) Portion of total that was from your network
$194,000	$207,600	$254,300	c) Portion of total from non-NCE funding sources

* Totals do not agree because of minor problems with missing data and incorrect addition by respondents. Note that some researchers reviewed small amounts of network funding after their network was informed of non-renewal.

Exhibit RX.4: Researchers at Non-Renewed Networks – Roughly what has been the proportional split* between your fundamental and applied research funding?: Average value per respondent

	In the 5 years prior to joining your network	While you were in your network	After your network terminated
Fundamental	70%	60%	64%
Applied	30%	40%	36%

Exhibit RX.5: Researchers at Non-Renewed Networks – If either your average total research funding has changed since the network terminated, or the balance of funding between fundamental and applied research has changed, what influence did the termination of the network have on this change?: % of respondents

	Influence on total funding	Influence on balance of effort
Major influence	56	23
Minor influence	26	30
No influence	13	39
Don't know	0	0
Not applicable (no significant change)	4	9

Exhibit RX.6a: Researchers at Non-Renewed Networks – Was your NCE research different from the type of research you were doing prior to joining the network?: % of respondents

Yes	66
No	34

Exhibit RX.6b: Researchers at Non-Renewed Networks – If your NCE research was different from your pre-NCE work, in what ways was it different?: % of respondents saying it was different

Because of NCE, I entered a new field of research, or addressed new topics, or tried new approaches	84
My NCE work involved important links to other disciplines facilitated by the NCE	41
My NCE work involved important new collaborations created through the NCE	76
My NCE work was more oriented towards needs of industry	56
My NCE work was more oriented towards needs of government	16
My NCE work was more oriented towards health care or social needs	5
Other	5

Exhibit RX.7: Researchers at Non-Renewed Networks – Which of the following best describes your current research program?: % of respondents

It is essentially the same as both my NCE work and the work I was doing prior to joining the network	55
It is essentially the same as my NCE work, but different from the research I did prior to joining the NCE	12
It is essentially the same as the work I did prior to joining the NCE, but different from my NCE research	20
It is different from both my NCE work and the research I did prior to joining the NCE	12

Exhibit RX.8a: Researchers at Non-Renewed Networks – Impact* of network features on research: % of respondents

	Neg. Value	0	+1	+2	+3	+4	+5	Avg. Value
Impact of the extra research funding you received through your network	0	12	2	6	14	12	54	3.74
Impact of your network's networking and collaboration	3	16	8	12	26	24	24	2.55
Impact of your network's management	18	30	18	12	8	6	8	0.82
Impact of your network's interactions with external sources (e.g., industry, government, hospitals)	6	30	20	10	14	8	6	1.22
Impact of your network's support for training highly qualified people	0	22	8	10	20	10	29	2.74

* Where -5=Major negative impact; 0=No impact; and +5=Major positive impact

Exhibit RX.8b: Researchers at Non-Renewed Networks – Of the positive impact – if any – of the network on your research, roughly what percentage is due to the extra research funding, and what percentage is due to other factors such as networking, management, and training? : % of respondents

Due to extra research funding	70%
Due to other factors	30%

Exhibit RX.9: Researchers at Non-Renewed Networks – Did participation in the NCE change your attitude about either collaborative or applied research?: % of respondents

	Collaborative Research	Applied Research
More positive attitude now	49	39
No change in attitude	47	55
More negative attitude now	4	6

Exhibit RX.10: Researchers at Non-Renewed Networks – What impact did being in the network have on your current research program?: % of respondents

	Increased by NCE	About the same	Decreased by NCE	Don't know
Scientific merit of your current research	43	55	2	0
Focus on industrial needs or impacts	42	58	0	0
Focus on government needs or impacts	19	75	2	4
Focus on health care needs or impacts	7	61	2	30
Focus on other social impacts	11	70	0	20
Focus on training needs or impacts	32	64	0	4

Exhibit RX.11: Researchers at Non-Renewed Networks – How many people worked on your research project: % of respondents*

	Prior to joining your network	While in your network	Your current team
Senior investigators from your university (including yourself, if applicable)	1.54	2.44	2.07
Senior investigators from other universities	0.53	1.95	1.08
Senior industry investigators (including yourself, if applicable)	0.19	0.54	0.49
Senior investigators from organizations such as government or hospitals (including yourself, if applicable)	0.82	1.00	0.87
Postdoctoral fellows	0.83	1.82	1.67
Graduate students	2.54	3.60	2.54
Other research assistants or associates	0.91	1.69	1.28
Technicians	0.76	1.35	0.90
Total	**8.12**	**14.39**	**10.90**

* The source of funding is irrelevant. Investigators outside your lab are included if they are making a significant contribution to your research.

Exhibit RX.12: Researchers at Non-Renewed Networks – In your present research, to what extent do you maintain the collaborations established while you were in the network?: % of respondents

	More than when in the network	About the same as when in the network	Less than when in the network	No current collaboration
With researchers at your university (if appropriate)	9	54	24	13
With researchers at other universities (if appropriate)	13	44	27	17
With industry	19	29	10	42
With government	9	47	11	34
With hospitals or health care agencies	2	22	2	73
Other	2	3	0	95

Exhibit RX.13: Researchers at Non-Renewed Networks – Approximately what proportion of your research has been multidisciplinary in nature? (This could be either through your own work in more than one discipline, or through being part of a multi-disciplinary team.): Average per respondent

	In your NCE research projects	In your non-NCE research projects
Prior to joining your network	N/A	44
While you were in your network	40	48
After network terminated	N/A	47

Exhibit RX.14: Researchers at Non-Renewed Networks – If there has been a change in the degree of multidisciplinarity of your work over time, what influence did your network have in this?: % of respondents

Major influence	Minor influence	No influence	Don't know	Not applicable – no change
8	28	33	5	28

Exhibit RX.15: Researchers at Non-Renewed Networks – Impact on the type of training provided to younger researchers compared to the training for similar researchers supported through non-NCE sources: % of respondents

	Training for Postdoctoral fellows				
Type of Impact	NCE provides poorer training	NCE training is about the same	NCE provides better training	Don't Know	N/A*
Overall quality of scientific training	0	38	47	4	11
Exposure to users in industry, government, health care	2	33	47	2	16
Involvement in research project planning and management	0	55	30	4	11
Experience with state-of-the-art equipment	0	40	40	4	15
Making professional contacts and networking	2	19	66	2	11
Impact on prestige and career	2	32	38	17	11
Ability to find a job	2	38	32	15	13

* N/A means the network provides no training.

	Training for Graduate Students				
Type of Impact	NCE provides poorer training	NCE training is about the same	NCE provides better training	Don't Know	N/A*
Overall quality of scientific training	4	38	42	6	10
Exposure to users in industry, government, health care	2	33	46	4	15
Involvement in research project planning and management	0	54	28	6	10
Experience with state-of-the-art equipment	2	36	44	6	14
Making professional contacts and networking	2	20	62	4	12
Impact on prestige and career	2	36	34	18	10
Ability to find a job	2	36	30	18	14

* N/A means the network provides no training.

Exhibit RX.16: Researchers at Non-Renewed Networks – Did your network have an effective management system for the following purposes?: % of respondents

	Yes	Partial success	No	Don't know
Selecting themes that cover the major fields necessary to achieve success in the network's overall goals	49	31	14	6
Selecting individual research projects that fit into the network themes	43	39	14	4
Allocating or changing support to individual projects	33	37	22	8
Identifying research results with potential for commercial or social benefits	31	43	18	8
Ensuring partners have the receptor capability to understand and use the research results	18	41	22	18
Formally or informally tranferring technology to partners and other users	25	47	18	10
Communicating NCE activities within the network	65	22	6	6
Communicating NCE activities outside the network	41	39	12	8

Exhibit RX.17a: Researchers at Non-Renewed Networks – What kind of practical applications are likely from your network research: % of respondents

No practical applications are likely	17
There will likely be application to:	
Policies or regulations of government agencies	34
Policies or regulations of hospitals or other health care organizations	6
Policies or regulations of industry	23
Disease/injury diagnosis, treatment, or identification of risk factors	13
Other social impacts (e.g., improved care of the elderly, improvements to quality of life, environmental impacts)	28
The R&D topics addressed by private sector companies	51
The R&D capability of private sector companies	36
Applications for patents, licenses, or other intellectual property protection	30
Further R&D investments being made by the private sector or the investment community	26
New products or services being actively developed by or for industry	45
New jobs being created, or jobs being retained that would have been otherwise lost	19
Other	6

Exhibit RX.17b: Researchers at Non-Renewed Networks – In roughly what time period are these applications likely to occur?: % of respondents

Some have already occurred	40
In the next 5 years	55
6-10 years from now	23
More than 10 years from now	10
Don't Know	8

Exhibit RX.18: Researchers at Non-Renewed Networks – How well informed were you about changes to Phase II goals and policies?: % of respondents

Very well informed	18
Moderately well informed	23
Not very well informed	32
Not at all informed	27

Exhibit RX.19: Researchers at Non-Renewed Networks – Are the Phase II NCE goals appropriate for the program as a whole? Would they have been appropriate for your network if it had been renewed?: % of respondents

	Yes	No	Don't know
For the program	27	18	56
For your network	26	23	51

Exhibit RX.20: Researchers at Non-Renewed Networks – What is your overall degree of satisfaction with the NCE program and your network?: % of respondents

	Moderately satisfied	Very satisfied	Not very satisfied	Not at all satisfied	Don't know
With the NCE program	35	21	23	17	4
With your network	22	51	12	10	4

APPENDIX D.1

DETAILED TABLES FROM THE SURVEY OF PARTNERS OF RENEWED NETWORKS — ANALYSIS BY SECTOR

Sector	N
Medical Networks	= 22
Electronic Networks	= 24
Other Networks	= 25
Unknown	= 2
Total	72

Note: Unless otherwise stated, data in exhibits that show only overall responses did not display any striking differences by sector

Exhibit PR.3: Partners of Renewed Networks – Employment of respondents

A private sector company	69%
A hospital	0%
A government organization	18%
Other.	13%

Exhibit PR.4: Partners of Renewed Networks – Approximate annual research and development budget (salaries and expenses) of your organization within Canada

	Average	Median
Total within Canada (including external contracts, network contributions, etc.)	$19,800,000	$3,500,000
Amount of Canadian total devoted to the general network subject area	$2,200,000	$175,000
Amount of Canadian total that was your most recent annual cash contribution to the network itself	$42,900	$1,000

Exhibit PR.5: Partners of Renewed Networks –

	Average	Median
Annual Canadian R&D budget as a percentage of your annual Canadian sales revenue	26%	4%

Exhibit PR.6: Partners of Renewed Networks – Is your organization an active participant in any of the following: % of respondents

	Overall	Medical	Electronic	Other
Network Board of Directors	31	27	38	28
Network Research Committee	24	18	25	28
Network Technology transfer, industry liaison, or intellectual property committee	34	32	21	48
Networking or communications committee	4	0	8	4
Other	21	23	13	28

Exhibit PR.7: Partners of Renewed Networks — How much input has your organization had into your network's activities?: % of respondents

	High input	Moderate input	Low input	Don't know
Network board/committee work	21	23	51	5
Planning the overall network research program or individual projects	17	30	50	3
Helping carry out some of the network research	22	27	44	7
Helping review and adjust the network research program	11	33	49	7
Applying network research results	36	33	28	3

Exhibit PR.8: Partners of Renewed Networks — Have you had as much input as you would like?: % of respondents*

	Yes	No	Don't know
Network board/committee work	65[1]	10	25
Planning the overall network research program or individual research projects	66[2]	26	8
Helping carry out some of the network research	69[3]	16	15
Helping review and adjust the network research program	53	28	18
Applying the network research results	68[4]	19	13

* % of those answering; roughly 15 - 20% did not respond.

1. Medical - 65%; Electrical - 75%; Other - 55%
2. Medical - 72%; Electrical - 57%; Other - 70%
3. Medical - 82%; Electrical - 67%; Other - 61%
4. Medical - 79%; Electrical - 59%; Other - 68%

Exhibit PR.9: Partners of Renewed Networks — How satisfied are you with the NCE Phase II program goals and policies?: % of respondents

	Overall	Medical	Electronic	Other
Highly satisfied	28	17	8	56
Moderately satisfied	43	39	58	32
Not very satisfied	4	4	4	4
Not at all satisfied	0	0	0	0
Don't know	3	9	0	0
Don't know what the goals and policies are	22	30	29	8

Exhibit PR.10: Partners of Renewed Networks — How have the new Phase II goals and policies affected the following?: % of the respondents*

	Higher	No change due to revisions	Lower	Don't Know
Your overall satisfaction with NCE program goals and policies	34[1]	29	6	31
Your satisfaction with your network	36[2]	30	5	30
Your willingness to join or stay in the network	31[3]	33	3	33
Your expectations that the network will produce useful results for your organization	31[4]	33	3	33
Your willingness to contribute in kind to the network	27	34	7	32
Your willingness to contribute cash to the network	17	37	5	42
Other	1	6	0	93

* % of those responding; roughly 19% did not answer.

1. Medical - 30%; Electrical - 21%; Other - 52%
2. Medical - 32%; Electrical - 25%; Other - 52%
3. Medical - 32%; Electrical - 17%; Other - 48%
4. Medical - 32%; Electrical - 17%; Other - 48%

Exhibit PR.11: Partners of Renewed Networks — How relevant are these elements of your network's research program to your organization?: % of the respondents

	High	Medium	Low	Don't know	Not Applicable
The overall network research program	34[1]	40	12	5	9
The theme/group(s) your organisation was most involved with	46	32	5	5	14
The specific project(s) your organisation was most involved with	61[2]	21	3	0	15

1. Medical - 18%; Electrical - 26%; Other - 59%
2. Medical - 64%; Electrical - 48%; Other - 73%

Exhibit PR.12: Partners of Renewed Networks — Does your network have effective management systems for the following purposes?: % of the respondents

	Yes	Partially effective	No	Don't know
Managing their research program	49	11	7	33
Ensuring the research is relevant to partner organizations	44	19	11	26
Identifying research results with potential for commercial or social benefits	49	26	3	22
Formally or informally transferring technology to partners and other users	44	30	6	20
Communicating NCE activities within the network	46	13	6	36
Communicating NCE activities outside the network	35	23	7	35

Exhibit PR.13a: Partners of Renewed Networks — Does your organization currently have the internal technical capability to use and exploit the network research results in their present form? Has the network had an influence on your technical capability?: % of respondents

	High	Moderate	Low	Don't know
Your organisation's technical capability	57[1]	35	5	3
The network's influence on your technical capability	20	36	38	6

[1] Medical – 77%; Electrical – 41%; Other – 63%

Exhibit PR.13b: Partners of Renewed Networks — Should your network have a role in improving your technical capability?: % of respondents

Yes	68[1]
No	20
Don't know	12

[1] Medical – 50%; Electrical – 90%; Other – 67%

Exhibit PR.14a: Partners of Renewed Networks – Extent to which the network has been useful for the organization to date: % of respondents*

	1 Not at All	2 Low	3 Moderate	4 High	5 Very High	Don't Know	Avg. Value**
Policies or regulations of government agencies (yours, if applicable)	35	16	10	8	6	25	2.14
Policies or regulations of hospitals or other health care organizations (yours, if applicable)	52	7	10	0	0	31	1.40
Policies or regulations of industry (your company, if applicable)	38	19	11	11	8	13	2.22
Identifying disease/injury diagnosis, treatment, or identification of risk factors	35	9	9	15	12	21	2.48
Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)	31	10	18	10	15	15	2.64
The R&D topics addressed by private sector companies (yours, if applicable)	7	18	33	23	18	0	3.28
The R&D capability of private sector companies (yours, if applicable)	12	20	32	28	8	0	3.02
Applications for patents, licenses, or other intellectual property protection	31	19	23	14	2	12	2.28
Further R&D investments being made by the private sector or the investment community (your organization, if applicable)	12	18	37	21	9	4	2.96
New products, processes, or services being actively developed by or for industry (your company, if applicable)	10	16	29	27	18	0	3.27
New jobs being created, or jobs being retained that would have been lost otherwise	20	18	22	15	13	12	2.81
Other	0	0	0	0	3	0	5.00

* Excluding "Not Applicable" for that organization

** Excluding D/K and N/A

Exhibit PR.14b: Partners of Renewed Networks – Extent to which the network has been useful for the organization in the future

	1 Not at All	2 Low	3 Moderate	4 High	5 Very High	Don't Know	Avg. Value**
Policies or regulations of government agencies (yours, if applicable)	31	18	7	22	2	20	2.33
Policies or regulations of hospitals or other health care organizations (yours, if applicable)	48	4	4	4	7	33	1.78
Policies or regulations of industry (your company, if applicable)	31	12	10	28	2	17	2.48
Identifying disease/injury diagnosis, treatment, or identification of risk factors	31	3	9	16	22	19	2.92
Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)	20	3	26	18	15	18	3.06
The R&D topics addressed by private sector companies (yours, if applicable)	3	8	22	41	20	5	3.97
The R&D capability of private sector companies (yours, if applicable)	5	12	25	42	13	3	3.48
Applications for patents, licenses, or other intellectual property protection	19	19	21	19	6	15	2.68
Further R&D investments being made by the private sector or the investment community (your organization, if applicable)	4	16	33	28	12	7	3.32
New products, processes, or services being actively developed by or for industry (your company, if applicable)	3	3	21	49	21	2	3.83
New jobs being created, or jobs being retained that would have been lost otherwise. How many jobs in your organization?[1]	14	10	26	22	14	14	3.14
Other	0	0	0	0	0	0	

* Excluding "Not Applicable" for that organization

** Excluding D/K and N/A

1. The average number of jobs created or retained for the 40 firms that responded was estimated at about 480 per firm, or about 19,000 in total. The median was about 6 jobs. Five firms estimated job creation at 1,000 - 5,000.

Exhibit PR.15: Partners of Renewed Networks – For your organization, do any of the network research results have the potential to lead to significant revenues being earned (or significant costs being saved), relative to the investment you have made?: % of respondents

	Overall	Medical	Electronic	Other
Yes	71	67	75	83
No	9	13	5	4
Don't Know	14	13	15	9
Not Applicable	7	8	5	4

If yes, roughly when will this happen?

	Overall	Medical	Electronic	Other
Some have already occurred	14	6	0	35
In the next 1 - 5 years	64	50	75	50
In the next 6 - 10 years	12	38	19	0
More than 10 years from now	5	0	0	10
Don't Know	5	6	6	5

Exhibit PR.16: Partners of Renewed Networks – Do any of the network research results have the potential to lead to significant social impacts, (e.g., improvements to health care, quality of life, or environment) in the foreseeable future?: % of respondents

	Overall	Medical	Electronic	Other
Yes	57	75	33	36
No	9	0	8	18
Don't Know	22			
Not Applicable	12			

If yes, roughly when will this happen?

	Overall	Medical	Electronic	Other
Some have already occurred	9	0	25	25
In the next 1 - 5 years	49	56	50	25
In the next 6 - 10 years	31	44	0	0
More than 10 years from now	0	0	0	0
Don't Know	6	0	25	25

Exhibit PR.17: Partners of Renewed Networks – If the network has not been highly useful to date, and you do not believe it is likely to be highly useful in the future, what factors contribute to its lack of usefulness?: % of respondents overall*

	Overall	Medical	Electronic	Other
Your organization is not very aware of the results of the network research	14	9	21	12
You don't have enough technical capability to apply the results	6	0	17	0
The overall quality of the research was not high	4	0	0	12
The research is long term, and it is too soon to tell how useful it will be	19	5	33	20
The research is not in areas relevant to your organization	14	14	29	0
Other	13	14	8	16

* About 44% of the total commented, but the figures shown include all respondents, not just those commenting.

Exhibit PR.18: Partners of Renewed Networks – Were there any network projects that your organization would have carried out anyway if the network did not exist? % of Respondents

	Overall	Medical	Electronic	Other
No, none of them would have been done without the network	33	43	27	29
Yes, at least some of the work would have been done anyway*	48	48	36	58
Don't know	19	10	36	13

*If yes, roughly how much would it have cost you without network assistance? (salaries and expenses)?	$190,000 on Average

If your organization would have carried out some of the research on its own, would there have been a delay?

	Overall	Medical	Electronic	Other
Yes. If yes, by how long? – 3.5 years on average	48	43	60	39
No	24	14	20	39
Don't Know	29	43	20	23

Exhibit PR.19: Partners of Renewed Networks – How important for your organization is the network for access to highly qualified people?: % of respondents

	Very Important	Moderately Important	Not Very Important	Not at all Important	Don't Know
	For access to highly skilled university researchers				
Overall	48	32	14	6	0
Medical	53	21	16	11	0
Electronic	59	32	5	5	0
Other	33	42	21	4	0
	For access to highly trained students you may hire				
Overall	28	39	19	13	2
Medical	16	26	37	21	0
Electronic	33	38	24	5	0
Other	35	52	0	13	0

Exhibit PR.20: Partners of Renewed Networks – Approximately how many Masters students, Ph.D. graduates and postdoctoral fellows has your organization hired who were trained in the same research field as the network, since your organization joined the network: Average value per respondent

	Total*	Masters	PhD graduates	Postdoctoral Fellows
Overall				
Number of new hires who received all or part of their training through your network	1.31	0.55	0.43	0.26
Number who received all of their training outside your network	2.38	1.11	0.80	0.38

* Totals do not equal sums because of errors by some respondents.

Exhibit PR.21: Partners of Renewed Networks – Have you seen any difference in the capabilities or knowledge of new hires depending on whether they received part or all of their training through the network?: % of respondents

	Overall technical capability			
	Network-trained new hires are better	There is no significant difference	Network-trained new hires are worse	Don't know
Overall	26	14	0	60
Medical	0	18	0	82
Electronic	30	10	0	60
Other	37	16	0	47

	Knowledge of your organization's needs and priorities			
	Network-trained new hires are better	There is no significant difference	Network-trained new hires are worse	Don't know
Overall	26	18	0	56
Medical	9	18	0	73
Electronic	25	15	0	60
Other	37	21	0	42

Exhibit PR.22: Partners of Renewed Networks – How do the benefits of the network to your organization compare to those from "normal" (i.e., non-NCE) university research?: % of respondents

	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Access to relevant, high quality university research and researchers	5	30	61	5
Access to highly-trained new staff	6	30	41[1]	22
Technology transfer to your organization	5	34	58	3
Other	0	1	8	91

[1] Medical – 16; Electronic – 48; Other – 56

Exhibit PR.23: Partners of Renewed Networks – What is your overall degree of satisfaction with the NCE program and your network?: % of respondents

	With the NCE program			
	Overall	Medical	Electronic	Other
Very satisfied	39	36	30	53
Moderately satisfied	53	57	55	47
Not very satisfied	8	7	15	0
Not at all satisfied	0	0	0	0

	With the network			
	Overall	Medical	Electronic	Other
Very satisfied	59	70	65	46
Moderately satisfied	36	25	30	50
Not very satisfied	5	5	5	4
Not at all satisfied	0	0	0	0

APPENDIX D.2

DETAILED TABLES FROM THE SURVEY OF PARTNERS OF RENEWED NETWORKS – ANALYSIS BY SIZE OF FIRM*

Size	N
Small (Total annual Canadian R&D budget < $1,000,000)	= 19
Medium (Total annual Canadian R&D budget $1 - 5,000,000)	= 18
Large (Total annual Canadian R&D budget > $5,000,000)	= 22
Total	56

Note: Unless otherwise stated, data in exhibits that show only overall responses did not display any striking differences by size. Firms that did not provide these data are not presented, so the overall averages are somewhat different from those in Appendix D.1.

Exhibit PR.9: Partners of Renewed Networks – How satisfied are you with the NCE Phase II program goals and policies?: % of respondents

	Overall	Small	Medium	Large
Highly satisfied	20	26	11	23
Moderately satisfied	46	37	39	59
Not very satisfied	5	0	11	5
Not at all satisfied	2	0	6	0
Don't know	0	0	0	0
Don't know what the goals and policies are	27	37	33	14

Exhibit PR.10: Partners of Renewed Networks – How have the new Phase II goals and policies affected the following?: % of the respondents responding "higher"

	% saying "higher"			
	Overall	Small	Medium	Large
Your overall satisfaction with NCE program goals and policies	30	31	24	35
Your satisfaction with your network	31	44	12	37
Your willingness to join or stay in the network	25	38	12	26
Your expectations that the network will produce useful results for your organization	25	38	18	21
Your willingness to contribute in kind to the network	25	31	18	26
Your willingness to contribute cash to the network	18	25	18	11

Exhibit PR.11: Partners of Renewed Networks – How relevant are these elements of your network's research program to your organization?: % of the respondents

	The overall network research program				
	High	Medium	Low	Don't know	Not Applicable
Small	29	53	18	0	0
Medium	53	29	6	0	12
Large	33	38	14	14	0

	The theme/group(s) your organization was most involved with				
	High	Medium	Low	Don't know	Not Applicable
Small	44	35	6	0	18
Medium	41	24	6	18	12
Large	62	29	5	0	5

	The specific project(s) your organization was most involved with				
	High	Medium	Low	Don't know	Not Applicable
Small	65	18	0	0	18
Medium	65	24	6	0	6
Large	57	29	5	0	10

Exhibit PR.13a: Partners of Renewed Networks – Does your organization currently have the internal technical capability to use and exploit the network research results in their present form? Has the network had an influence on your technical capability?: % of respondents

	Your organisation's technical capability			
	High	**Moderate**	**Low**	**Don't know**
Small	61	28	11	0
Medium	71	29	0	0
Large	33	52	5	10

	The network's influence on your technical capability			
	High	**Moderate**	**Low**	**Don't know**
Small	17	50	28	6
Medium	18	35	47	0
Large	14	29	48	10

Exhibit PR.13b: Partners of Renewed Networks – Should your network have a role in improving your technical capability?: % of respondents

	Small	Medium	Large
Yes	71	86	67
No	30	7	14
Don't know	0	7	19

Exhibit PR.14a: Partners of Renewed Networks – Extent to which the network has been useful for the organization to date: % of respondents rating usefulness as moderate, high or very high*

	% saying moderate, high, or very high		
	Small	Medium	Large
Policies or regulations of government agencies (yours, if applicable)	14	40	36
Policies or regulations of hospitals or other health care organizations (yours, if applicable)	13	14	0
Policies or regulations of industry (your company, if applicable)	20	46	22
Identifying disease/injury diagnosis, treatment, or identification of risk factors	27	33	29
Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)	16	72	50
The R&D topics addressed by private sector companies (yours, if applicable)	80	75	70
The R&D capability of private sector companies (yours, if applicable)	75	75	58
Applications for patents, licenses, or other intellectual property protection	46	13	44
Further R&D investments being made by the private sector or the investment community (your organization, if applicable)	71	75	63
New products, processes, or services being actively developed by or for industry (your company, if applicable)	76	69	68
New jobs being created, or jobs being retained that would have been lost otherwise	60	56	26

Exhibit PR.14b: Partners of Renewed Networks – Extent to which the network has been useful for the organization in the future – % rating usefulness as moderate, high, or very high

	% saying moderate, high, or very high		
	Small	Medium	Large
Policies or regulations of government agencies (yours, if applicable)	20	33	38
Policies or regulations of hospitals or other health care organizations (yours, if applicable)	14	0	10
Policies or regulations of industry (your company, if applicable)	31	42	39
Identifying disease/injury diagnosis, treatment, or identification of risk factors	40	50	50
Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)	36	72	69
The R&D topics addressed by private sector companies (yours, if applicable)	92	88	85
The R&D capability of private sector companies (yours, if applicable)	87	88	74
Applications for patents, licenses, or other intellectual property protection	45	33	53
Further R&D investments being made by the private sector or the investment community (your organization, if applicable)	69	88	74
New products, processes, or services being actively developed by or for industry (your company, if applicable)	93	94	90
New jobs being created, or jobs being retained that would have been lost otherwise.	77	73	42

Exhibit PR.15: Partners of Renewed Networks – For your organization, do any of the network research results have the potential to lead to significant revenues being earned (or significant costs being saved), relative to the investment you have made?: % of respondents

	Overall	Small	Medium	Large
Yes	71	84	61	67
No	9	5	0	19
Don't Know	14	11	22	10
Not Applicable	7	0	17	5

If yes, roughly when will this happen?

	Overall	Small	Medium	Large
Some have already occurred	14	20	0	21
In the next 1 - 5 years	64	73	82	50
In the next 6 - 10 years	12	30	0	29
More than 10 years from now	5	7	9	0
Don't Know	5	0	9	7

Exhibit PR.16: Partners of Renewed Networks – Do any of the network research results have the potential to lead to significant social impacts, (e.g., improvements to health care, quality of life, or environment) in the foreseeable future?: % of respondents

	Overall	Small	Medium	Large
Yes	57	63	59	50
No	9	5	6	14
Don't Know	22	21	18	27
Not Applicable	12	11	18	9

If yes, roughly when will this happen?

	Overall	Small	Medium	Large
Some have already occurred	7	0	10	9
In the next 1 - 5 years	50	67	50	36
In the next 6 - 10 years	20	11	10	36
More than 10 years from now	10	11	10	9
Don't Know	13	11	20	9

Exhibit PR.17: Partners of Renewed Networks – If the network has not been highly useful to date, and you do not believe it is likely to be highly useful in the future, what factors contribute to its lack of usefulness?: % of respondents overall*

	Overall	Small	Medium	Large
Your organization is not very aware of the results of the network research	18	5	33	14
You don't have enough technical capability to apply the results	5	5	6	5
The overall quality of the research was not high	5	0	6	9
The research is long term, and it is too soon to tell how useful it will be	18	11	22	18
The research is not in areas relevant to your organization	14	5	22	14
Other reason	14	26	11	5

* About 44% of the total commented, but the figures shown include all respondents, not just those commenting.

Exhibit PR.18: Partners of Renewed Networks – Were there any network projects that your organization would have carried out anyway if the network did not exist? % of Respondents

	Overall	Small	Medium	Large
No, none of them would have been done without the network	35	53	12	36
Yes, at least some of the work would have been done anyway*	47	32	65	46
Don't know	20	16	24	18

If your organization would have carried out some of the research on its own, would there have been a delay?

	Overall	Small	Medium	Large
Yes. If yes, by how long?	49	58	50	36
No	24	0	38	36
Don't Know	27	42	14	27

Exhibit PR.19: Partners of Renewed Networks – How important for your organization is the network for access to highly qualified people?: % of respondents

	Very Important	Moderately Important	Not Very Important	Not at all Important	Don't Know
	For access to highly skilled university researchers				
Overall	16	35	15	6	0
Small	50	31	13	6	0
Medium	53	18	18	12	0
Large	36	50	14	4	0
	For access to highly trained students you may hire				
Overall	32	36	23	9	2
Small	40	33	13	13	0
Medium	31	25	25	19	0
Large	27	46	27	0	0

Exhibit PR.22: Partners of Renewed Networks – How do the benefits of the network to your organization compare to those from "normal" (i.e., non-NCE) university research?: % of respondents

	Access to relevant, high quality university research and researchers			
	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Small	6	18	77	0
Medium	0	56	44	0
Large	5	32	64	0

[1] Medical-16; Electronic-48; Other-56

	Access to highly-trained new staff			
	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Small	0	19	50	31
Medium	6	25	50	19
Large	9	46	27	18

	Technology transfer to your organization			
	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Small	0	24	71	6
Medium	0	44	56	0
Large	9	46	46	0

Exhibit PR.23: Partners of Renewed Networks – What is your overall degree of satisfaction with the NCE program and your network?: % of respondents

	With the NCE program			
	Overall	Small	Medium	Large
Very satisfied	33	31	46	25
Moderately satisfied	57	54	39	75
Not very satisfied	10	15	15	0
Not at all satisfied	0	0	0	0

	With the network			
	Overall	Small	Medium	Large
Very satisfied	55	56	56	53
Moderately satisfied	40	44	31	42
Not very satisfied	6	0	13	5
Not at all satisfied	0	0	0	0

APPENDIX E

DETAILED TABLES FROM THE SURVEY OF PARTNERS AT NEW NETWORKS

N = 25

Exhibit PN.3: Partners of New Networks – Is your organization

A private sector company	44%
A hospital	0%
A government organization	20%
Other	36%

Exhibit PN.4: Partners of New Networks – Approximate annual research and development budget (salaries and expenses) of your organization within Canada?

	Average	Median
Total within Canada (including external contracts, network contributions, etc.)	$12,160,000	$450,000
Portion of Canadian total devoted to the general network subject area	$3,350,000	$100,000
Portion of the Canadian total that was your most recent annual cash contribution to the network itself	$58,000	$10,000

	Average	Median
Roughly what is your annual Canadian R&D budget as a percentage of your annual Canadian sales revenue?	38%	4%

Exhibit PN.6: Partners of New Networks – How relevant are these elements of your network's research program to your organization?: % of respondents

	High	Medium	Low	Don't know	Not Applicable
The overall network research program	57	26	9	0	9
The theme/group(s) your organisation is most involved with	61	26	4	0	9
The specific project(s) your organisation is most involved with	70	9	0	0	22

Exhibit PN.7: Partners of New Networks – Is your organization an active participant in any of the following?: % of respondents

Network Board of Directors	70
Network Research Committee	30
Network Technology transfer, industry liaison, or intellectual property committee	25
Networking or communications committee	10
Other	30

Exhibit PN.8: Partners of New Networks – How much input has your organization had into your network's activities?: % of respondents

	High input	Moderate input	Low input	Don't know
Network board/committee work	41	27	27	5
Planning the overall network research program or individual projects	23	46	31	0
Helping carry out some of the network research	27	41	27	5
Helping review and adjust the network research program	9	39	44	9
Applying network research results	28	33	28	11

Exhibit PN.9: Partners of New Networks – Have you had as much input as you would like? % of respondents

	Yes	No	Don't know
Network board/committee work	75	10	15
Planning the overall network research program or individual research projects	70	25	5
Helping carry out some of the network research	85	10	5
Helping review and adjust the network research program	62	29	10
Applying the network research results	82	6	12

Exhibit PN.10: Partners of New Networks – How satisfied are you with the NCE Phase II program goals and policies?: % of respondents

Highly satisfied	43
Moderately satisfied	19
Not very satisfied	5
Not at all satisfied	0
Don't know	10
Don't know what the goals and policies are	24

Exhibit PN.11: Partners of New Networks – Does your network have effective management systems for the following purposes?: % of respondents

	Yes	Partially effective	No	Don't know
Managing their research program	65	17	4	13
Ensuring the research is relevant to partner organizations	64	18	5	14
Identifying research results with potential for commercial or social benefits	52	19	5	24
Formally or informally transferring technology to partners and other users	52	24	5	19
Communicating NCE activities within the network	48	39	0	13
Communicating NCE activities outside the network	30	35	4	30

Exhibit PN.12a: Partners of New Networks – Does your organization currently have the internal technical capability to use and exploit the network research results in their present form? Has the network had an influence on your technical capability?: % of respondents

	High	Moderate	Low	Don't know
Your organisation's technical capability	55	35	10	0
The network's influence on your technical capability	33	39	22	6

Exhibit PN.12b: Partners of New Networks – Should your network have a role in improving your technical capability?: % of respondents

Yes	62
No	24
Don't know	4

Exhibit PN.13: Partners of New Networks – Extent to which the network is likely to be useful to your organization in the future: % of respondents*

Usefulness as an influence on:	1 Not at all	2 Low	3 Moderate	4 High	5 Very High	Don't Know	Avg. Value**
Policies or regulations of government agencies (yours, if applicable)	6	13	38	13	19	13	3.29
Policies or regulations of hospitals or other health care organizations (yours, if applicable)	17	8	8	33	0	33	2.88
Policies or regulations of industry (your company, if applicable)	0	13	31	31	19	6	3.60
Identifying disease/injury diagnosis, treatment, or identification of risk factors	25	0	0	33	8	33	3.00
Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)	0	6	12	59	24	0	4.00
The R&D topics addressed by private sector companies (yours, if applicable)	0	6	24	53	6	12	3.67
The R&D capability of private sector companies (yours, if applicable)	0	19	13	38	13	19	3.54
Applications for patents, licenses, or other intellectual property protection	6	6	17	33	11	28	3.54
Further R&D investments being made by the private sector or the investment community (your organization, if applicable)	0	12	0	71	6	12	3.80
New products, processes, or services being actively developed by or for industry (your company, if applicable)	0	6	6	56	22	11	4.06
New jobs being created, or jobs being retained that would have been lost otherwise.	6	6	18	41	18	12	3.67
Other	0	0	0	0	0	0	–

* Excluding "Not Applicable" for that organization

** Excluding Don't Know and Not Applicable

Exhibit PN.14: Partners of New Networks – Are there any network projects that your organization would have carried out anyway if the network did not exist?: % of respondents

No, none of them would have been done without the network	48
Yes, at least some of the work would have been done anyway	48
Don't know	5

If yes, roughly how much would it have cost you without network assistance? (salaries and expenses)?	$77,000 (Average)

Exhibit PN.15: Partners of New Networks – How do the expected benefits of the network to your organization compare to those from "normal" (i.e., non-NCE) university research?: % of respondents

	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Access to relevant, high quality university research and researchers	11	11	74	5
Access to highly-trained new staff	5	21	68	5
Technology transfer to your organization	11	17	50	22
Other. What	0	0	4	0

Exhibit PN.16: Partners of New Networks – Overall degree of satisfaction with the NCE program and your network so far?: % of respondents

	With the NCE program	With your network
Very satisfied	58	50
Moderately satisfied	32	45
Not very satisfied	11	5
Not at all satisfied	0	0

APPENDIX F

NETWORK CASE STUDIES

Appendix F – Network Case Studies

Methodology

First, documents related to each individual network were reviewed. These included the network Annual Reports, the Transition Reports for each network (written during the transition from Phase I to Phase II), the reports of the individual external reviewers for the Phase II applications, the summary reports of the Phase II Selection Committee, and some of the appendix table material for each network.

Interviews were then carried out with each network officer (typically the scientific leader and the network manager, and sometimes with the commercialization officer or equivalent), the Chair of each network Board of Directors, the V-P Research (or equivalent) and UILO officer most familiar with the network at each university having a network administrative headquarters, UILO officers at the "node" universities (those associated with one or more networks, but not having a network headquartered there), and the NCE federal program officer responsible for each network. The opinions of all but the last group are found in Table F1.

Findings

The results in the Table are reasonably self-explanatory. In sum:

Issue Group 1: Quality and relevance of research

- High quality research is being carried out by high quality researchers, and this research is clearly in areas of high strategic importance, either because of existing Canadian industrial capability (e.g., in telecommunications), or in areas in which significant social, health, or economic benefits might be expected (e.g., in biomedical areas).

Issue Group 2: Impact in developing or retaining scientists and engineers in relevant fields

- The program is providing high quality training to graduate students and post-doctoral students.
- The program has a limited impact on attracting senior investigators to Canada, or retaining those already here.
- The program is having a modest impact on increasing the receptor capability of Canadian industry in fields where it does not already exist, but there are notable limitations to its ability to do so.

Issue Group 3: Extent of management of multidisciplinary, multisectoral, integrated research programs.

- The programs are being managed reasonably well, they are multidisciplinary, and multisectoral, and integrated (especially in new networks). The degree and quality of management and integration varies somewhat from network to network.
- Research is probably managed somewhat better than technology transfer, and collaboration and networking are not so much managed as strongly supported.

Issue Group 4: Degree of acceleration of exchange of research results and technology transfer

- There is a tremendous increase in knowledge exchange among university researchers, with particular changes being found in cross- Canada and inter-lab increases.
- The networks have successfully increased the exchange of knowledge with users, and are better at this, on average, than other council programs.
- Significant hurdles exist to technology transfer.
- There are many opportunities being actively explored for significant technology transfer through training of HQP, access to university expertise, access to new product/process ideas and/or IP (with consequent sales revenues or cost savings), and benefits to education, health, quality of life, the environment, and so on.
- Networks believe they are more successful at identifying and pursuing these opportunities than through usual programs; universities don't necessarily agree, but don't think they're worse.

Issues Groups 5 and 9: Impact of program design and Phase II reorientation

- The NCE goals and policies are accepted by most participants;
- The goals and policies are appropriate for all sectors, with the caveat that measurement of impact must take into account different external user needs;
- All networks have become more applied in focus during Phase II; new networks are particularly so (and also probably more multisectoral and integrated), but still have a significant fundamental research component;
- There is a strong desire on the part of network participants for a permanent NCE program; most — but by no means all — university respondents would agree;
- Program funding uncertainty has limited the commitment of some partners, researchers, and universities to individual networks;
- The 10% carry-over rule caused some difficulties, primarily due to forced short-term thinking;
- "Ramping down" of network funding is not consistent with proper project management or corporate-type planning.

Issue Group 6: Impact of network management styles

- Every network has a different model, and rightfully so. Each sector and individual group of partners has different needs.
- Success may be as dependent on individuals as the models employed.
- Incorporation has benefits for networks that wish to act more like corporations, but introduce complexities and costs, possible conflicts of interest, plus possible headaches for university partners; still, most networks are moving that way.

Issue Group 7: Impact of federal program management

- This has been seen as moderate to good, especially for administrative and bureaucratic issues.
- Some networks and university V-Ps Research believe that more senior level council and Industry Canada commitment and participation is required, as well as more policy advice.
- Although networks could survive without federal management, they could not survive without funding.

Issue Group 8: Impact of external factors:

- Each industrial sector has significantly different needs, expectations, and receptor capability; these drive the methods networks can use for commercialization or other exploitation of the research, and differ markedly from sector to sector, firm to firm, and project to project.
- The universities and networks are coming into significant actual and future potential conflicts around issues of IP ownership, contract negotiations, revenue sharing from licences, royalties, and contract overheads. There may also be conflicts of interest among some network researchers, and conflicts with the universities' research, teaching, and publication mandates.

Issue Groups 10/11: Value-added incrementality of network and program design

- the research that has a more applied focus than is usually the case;
- there is more collaboration among university researchers, with evidence of more collaboration than usual across different institutions;
- there is more interaction between university researchers and external partners, especially those in industry;
- there is more interdisciplinary research (more disciplines, and sometimes more people from various disciplines on individual research teams);
- there are significant attempts to try to transfer knowledge and technology for Canada's benefit through a wide variety of mechanisms (some of which vary by sector);
- there are a substantial number of projects that are expected to lead to significant economic and/or social benefits to Canada through application by the private sector,

government organizations, hospitals, increases to the "public good"; where industry has been involved, the companies generally would not have done the work at all, or in some cases would not done it as early, without the NCE; and

- there are significant changes in the way students and postdoctoral fellows are trained, particularly in terms of the amount of collaboration and industry exposure they experience.

The results also show that many external impacts in terms of economic and social benefits are just beginning, with most external partners anticipating substantial additional benefits to begin in the next 5-year time span, plus (for some products/processes) additional benefits in subsequent years. They also show a high degree of variation in individual networks — each is on a different point along the spectrum of pure to applied research, has a different user sector in terms of maturity and receptor capability, and is using a different management model. There is no one perfect model, but a variety, each with strengths and weaknesses. The networks also show the importance of individuals — in some cases the individuals involved are at least as important as the model being followed.

There are problems in a few areas:

- Networks have little or no control on some external factors that affect application of research results; there are also problems in the way Canadian industry operates that are unlikely to be solved by the NCE. Lack of receptor capability continues to be a factor in some sectors, and it is unrealistic to expect any given network to have more than a small impact — especially given other problems such as the state of the economy, perceived lack of federal support for industrial R&D, strong multinational competition, and so forth. There is a strong conflict between the perceived need to have short-term impacts (which tends to lead to reliance on lower-risk, shorter-term solutions such as simple licencing of new technology), versus a desire to produce the greatest long-term benefit to Canada (which tends to foster creation of start-up companies, many of which may not survive, or which will produce benefits only after 10-15 years even if successful).
- There is a basic conflict in the way university research is carried out, versus how industry R&D is done, that has been only partially resolved by the NCE program and individual networks. In particular, industry needs to follow through on specific projects when the results are encouraging commercially, but abandon those that don't have commercial promise or that don't fit into a firm's commercial strategy or product line. University researchers may wish to abandon projects that are of lesser interest scientifically, instead pursuing exciting but non-commercial research options that arise part way through the project. In essence, the two groups often have different criteria for continuing or terminating a given project. These problems are exacerbated by the short-term pressures on industry versus the long-term interests of university investigators. Finally, there are still conflicts between the university researchers' need to publish and the industry's need to keep some results confidential. These may result in industry being leery of committing to a network research program, or result in networks focusing on generic issues instead of proprietary ones.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
3. Management Issues (continued)				
Management mechanisms for communication and collaboration	Degree of *management* of collaboration varies; most networks assume this is a given. Researchers will be terminated for non-collaboration. Several networks select researchers explicitly on their proven willingness to collaborate. Many mechanisms for internal communication, including AGM, newsletters, project and theme meetings, seminars, technical workshops, visits between labs, etc. Some mechanisms for external collaboration, including WWW sites, newsletters, mailings to firms in relevant industries, project description reports, etc.	Most networks rated as good; a few as moderate; one as poor. Canada-wide networking benefits especially mentioned, as was popularity of internal network meetings (including for non-network university researchers). Some concerns that confidentiality is not always respected for external communications — some public network documents believed to contain highly valuable strategic data.		
4. Degree of Acceleration of Knowledge Exchange and Technology Transfer				
	Many examples of actual and potential technology, transfer and specific applications (see detailed case studies and B/C analysis elsewhere). These are related to sales of new/improved products and processes; access to, and development of HQP; improvements to health, quality of life, the environment, education, codes and standards, regulations, etc. However, only some network benefits can be captured through "product sales" methods; many provide significant "public good" benefits or benefits over such long time frames that they are impossible to quantify. Within all categories of benefits, some network projects have the potential for huge impacts, much of which can be considered at least moderately incremental to the program. Every network takes a different approach to knowledge and technology transfer — among them all the bases are covered.	Networks were rated overall as moderate to good at this function, but many Chairs would like this focus to be even stronger. See Issue 5./9.	Several respondents thought there was good technology transfer to industrial partners with "lots of spin-offs". However, several respondents said that the four year network cycle was simply too short and "utterly unrealistic" for technology transfer, which is a long-term concern needing lots of patience. Networks were not always seen to have this patience, and therefore it was still too early to accurately judge the success of the program.	Overall respondents were split as to the effectiveness of technology transfer in the network projects. About half of the UILOs thought that the network was quite successful at it (although it was thought to be a bit early to expect too much at this stage), while the other half thought that the networks were not very effective at it. About a third of the UILO's reported that they had had full and total involvement with the network around technology transfer, including setting up contacts with and participating in negotiations with industry, dealing with licensing issues and so on.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
4. Degree of Acceleration of Knowledge Exchange and Technology Transfer (continued)				
	Some networks work in narrow specialized fields with well-known applications; others work in enabling or platform technologies with potential applications in many fields, and with many applications as yet unknown. A typical approach is for a network to try to spin off a company for exploiting platform or enabling technology (in order to maximize Canadian value), often in alliance with a large partner; but licence a simple one-product technology. However, perceived central Agency pressures for "results" can alter these strategies. Medical networks are using "bundling" of technologies from different fields and/or universities to maximize value added. Also true (perhaps to lesser degree?) in other fields. Easiest technology transfer is usually to company with in-house expertise, but this may not satisfy "Canada First". Several networks trying to provide "one stop shopping" for research, HQP, IP, contract negotiations, etc.		There were widely varied opinions as to whether networks were better than "normal" council research programs at technology transfer — however, they were not seen to be worse.	One respondent said that while their participation had been quite significant and valuable in the early years, the network had dramatically changed its priorities recently and no longer supported the UILO's involvement in technology transfer with either funds or availability of network personnel. Several other UILO's reported that they had participated primarily in some form of contract review or contract activity, while the remaining third of the respondents said they had little or no contact at all with the networks.
5./9. Impact of Program Design and Reorientation				
	Goals and policies generally well-accepted by all networks, especially new ones. Main concern is that "relevance" not be measured by product sales alone, and some unclarity regarding selection criteria. Split of effort between discovery versus developmental research changed from Phase I to Phase II: most "old" networks moved towards more developmental research; the new networks were already there. Current split varies considerably by network. (Only one networks worries that current split of effort is too far towards applied side.) Less shift for networks that were applied to start with. Part of the shift due to program reorientation; part is due to natural evolution of each network to meet relevance goal.	Goals and policies unanimously accepted, as were the changes for Phase II. Main concern is that councils and federal government understand the long time frame needed to commercialize research: "Everyone understands the goals and objectives except the feds."	Several respondents thought that the increased Phase II focus on application was appropriate, one individual calling it a "watershed" approach. Overall, most respondents felt the program filled a valuable niche.	Most respondents were in favour of the Phase II goals, although several had no opinion or information on the subject. A few respondents were concerned that the applied research focus not be pushed too far and that quality of life was still an important issue in research.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
5./9. Impact of Program Design and Reorientation (continued)				
	For new networks, the research can be conceptualized as having fundamental aspects within an applied problem; for most — but not all — of the old networks, vice-versa. Several networks terminated projects in Phase II due to not meeting program criteria, many had a few researchers leave due to discomfort with criteria — in one network, 30% left. More projects were terminated in Phase II than in Phase I for lack of relevance. Some networks use a matrix approach (disciplines versus applications) to help manage both research and relevance. The 10% carry over rule caused short-term thinking at some networks, and is not consistent with a business-like approach. "Ramping down" of funding is inconsistent with industry needs (most research investment at start; if commercialized, firms need to spend internally later). Requiring cash from companies also encourages firms to want exclusive IP licences, which is inconsistent with pre-competitive nature of some networks. Funding uncertainty, and especially *program* uncertainty, makes it difficult to attract new partners and gain credibility with universities. Four year time frame is too short: networks spend 1 year gearing up after award and 1 year preparing renewal application; also doesn't fit with time frame for applying research. Many networks have trouble with "Canada First" rule if no obvious Canadian partner exists — flexibility within spirit of rule greatly desired, but intent of the rule well-accepted. Current program reporting methods and timing are much improved.	All networks save those already in very applied fields were seen to have adjusted their operation in response to the Phase II reorientation: more applied focus, more value-added approaches, termination of some projects, etc. There are significant and strong disagreements within the Chairs as to what the role of networks should be: from supporting basic research with an applied focus at one end of the spectrum, to acting as pure corporations with a completely business focus at the other. Some of the Chairs are pushing for a much stronger business focus (but none discussed potential problems with student training, conflicts of interest among researchers, etc.). Two Chairs were concerned that the need for support of basic science was being lost. Chairs agreed that program funding uncertainty and "ramping down" had been problematical.	However, the necessity to keep the network focus on training and basic scientific knowledge for Phase III were also mentioned, while other respondents mentioned the need to build in industry funding for Phase III. Overall, there was divergence of opinion as to the appropriate goals for the program — as for Chairs, some V-Ps believed that Phase III should focus on application; others, on science. The Canada First rule needs to be adjusted so that it allows for more flexibility in cases when there is neither Canada receptor capacity nor an appropriate means to establish a spin off company. Respondents suggested that this be a guideline rather than a rule.	Most UILOs had no information as to the impacts of changes between Phase I and Phase II, while a few said there was no difference for the university. The NCE program design was seen as appropriate to achieve its goals by about half of the UILOs. Several others were particularly concerned with the size and remoteness of the networks, urging the NCE to focus on more local involvement, particularly of local industry. They were concerned that the networks took resources out of the community. Respondents also wanted more communication and involvement with the networks and more of a focus on the social sciences. Most respondents felt that the NCE fills a useful niche in the spectrum of research support programs especially in terms of the its emphasis on collaborations.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
6. Impact of Management Styles				
	In general, most networks have reasonably effective management. No one model can be seen as preferable to others, and models need to vary by sector. However, new networks probably have themes better integrated into one coherent program than the old networks do, on average. There are advantages to having strong integration, strong theme focus, specific project and theme milestones where possible, and high understanding of IP issues on part of researchers (especially where inventors own the IP) Most old networks have either incorporated, or have incorporated "arm's length" entities, or are thinking about it. Advantages are increased credibility with industry, ease of dealing with IP and negotiation issues, ability to take equity in spin-offs and get product liability insurance. Disadvantages are complexity, end costs	Chairs hold no opinions about the effectiveness of different management styles. Chairs had similar opinions about incorporation as network officers, except more so.	Many respondents were critical of the push for incorporation. This was seen to potentially lead to conflicts with universities, and potential conflicts of interest for researchers and network officers.	Opinions about networks incorporating were somewhat negative, for scattered reasons. (About half of the respondents had no opinion.) Comments included that incorporation made no difference, that it would create more of a barrier between basic and applied researchers, that only the larger networks should incorporate, or that it would make things such as liability issues more complicated.
7. Impact of Federal Program Management				
	Generally federal management is seen as good to excellent for administrative matters; poor to moderate for policy matters. Most networks could exist without federal management, but there are some advantages through federal coordination of networks. Some networks perceive lack of high level commitment from councils and Industry Canada, lack of "championship". All would prefer a permanent program with networks coming and going.	Chairs agreed that federal management had been generally good, responsive, and helpful. Half believed that it had been too focused on bureaucratic issues and not enough on policy issues, and that there had been insufficient senior-level involvement and leadership at council and Industry Canada.	Not asked	Not asked

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
7. Impact of Federal Program Management (continued)				
	None of the networks would survive except in very limited fashion without federal funding. (Non-renewed networks retained limited local collaborative efforts, but little or none nationally.) Joint management by tri-council and Industry Canada is usually transparent to networks, with the exception of decrease in MRC funding being passed along to medical networks, and inconsistent application of 10% carry over rule.	In general, many Chairs believe that the councils and Industry Canada "don't understand the value of what they've got" and "should be thrilled", wishing the program to be permanent. Most don't believe their network would survive without federal management, and certainly not without funding.		
8. Impact of External Factors				
	In the biomedical fields, a more applied focus is now possible because new technologies have shortened the lag time between discovery and application. Some biomedical impacts are related to health care policies; e.g., differences in Canadian and US systems will affect revenues, industrial interest, etc. Expectations of partners vary sharply by sector and size of firm: In Canada there is no significant existing biotech industry, so commercialization for Canadian benefit poses problems. "Big Pharma" is foreign/multinational and wants IP for specific projects, but is not interested in general access to research as has internal capability (affects patenting strategy — networks thus wish to patent early and lots); SMEs in this field need much more technology transfer and access to expertise; there is lack of supplier firms in biomed field.	Receptor capability was varied: some sectors were low, most were moderate, and some were high. Generally the Chairs echoed the responses of network officials. Difficulties with "Canada first" and conflicts between networks and universities were often cited.	Virtually all respondents mentioned significant problems concerning the lack of overhead and infrastructure support for universities. According to several of the respondents there were also difficulties concerning the Internal Agreements — many were considered much too complicated and vague. The most serious concern was regarding the complexity of IP agreements and the networks' approach to the agreements. These were essentially the reverse of the networks' concerns, in that several of the universities in which the ownership of IP resides at the institution believed that the networks' technology transfer operations were unnecessarily duplicating those of the university (but without networks having the requisite expertise).	There was concern mentioned by several of those interviewed concerning the lack of connection between the networks and the university and the lack of communication from the network. A few respondents said that there was some difficulty around contract negotiations and intellectual property issues in terms of defining which property was a result of NCE work, non-NCE work and pre-NCE work. There was also some indication that the quality of their office's involvement with the NCE depended on which network they were dealing with.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
8. Impact of External Factors (continued)				
	Canada has significant capability in electronics and telecommunications. Large firms in this field want access to expertise, students, and postdocs, but don't care about specific products or IP rights may or may not care about long term research, and may also be suspicious of partnerships with other firms. Both large firms and SMEs in electronics usually have strong internal capability. Forestry, engineering and construction firms have had mixed competitive success internationally. Some have little or no in-house R&D. They may be very competitive with one another and only be interested in exclusive IP licences; smaller firms may not pursue any project with payoff more than 2 years away. Provincial policies affect network research; especially Quebec tax credits for R&D and ability to borrow on same. Existence of "angels", seed capital, venture capital, and mezzanine (commercialization) capital continues to be a significant problem in the biomedical field, though some improvement through CMDF, network-sponsored funds, etc. Higher salaries in US is also a barrier to employment of HQP in Canada. Relationships with partner universities are generally adequate to good, but most networks are having conflicts with their UILOs related to ownership of IP, industrial contract negotiations, delays through red tape, revenue sharing, overhead expenses, etc. (See text)	Many Chairs wish that their network owned the IP and were solely responsible for contract negotiations, etc. University UILOs were said to be too regional, too short-term in thinking, not value-added enough, too protective of their offices, much too slow when responses were needed in hours or days (not weeks or months), and usually able to deal only with single technologies, not "bundles". (However, see comment above re: networks needing more expertise in this area as well.) One Chair noted that both universities and networks overestimate the value of their contribution to the commercialization process, insisting on too much revenue return from the private sector, which bears most of the costs of development. This makes significant industrial and venture capital involvement difficult.	Respondents wished tech transfer to be a joint endeavour between the networks and the universities. While several respondents were quite willing to work with the networks on this activity, they also emphasized the necessity for universities to have a major role in tech transfer and for networks not to see themselves as the "commercialization arm". Some respondents also found the networks' focus on technology transfer potentially put them in a conflict of interest regarding the need to do research, train students, and publish freely. At a few universities, feelings ran strong on these issues. At some institutions, however, and especially where inventors owned the IP, the universities were happy to obtain the assistance of the networks in technology transfer, essentially believing that "the more the better". Even so, they noted that every deal had to be negotiated on an individual basis.	While about half of the UILO's reported that there were no other difficulties with any of the network policies, a few said that they needed to have some form of funding for overhead.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
10./11. Value-added by NCE Program:				
On nature of research:	Big changes are networking across different institutions across Canada, applied and market focus of research, integrated programs that deal with all aspects of a problem through inclusion of more and different disciplines (1-stop shopping on research problem). The collaborative approach is new in some fields, amplified in others. The network is one important factor, but not the only one. In non-renewed networks, some local collaboration continued, but not Canada-wide. New Phase II networks show especially strong integrated, multidisciplinary approaches, but true of all networks, and signs of increased collaboration between networks (including old). Possibly more benefit of network approach to younger researchers than established ones. Almost all networks found it easy to provide concrete examples of specific network results that would not have occurred without the network — generally because of the increased breadth, collaboration, and applied focus; rarely because of additional funding. Only one network found its research program too diffuse to say whether specific topics would not have been investigated without the network; but they are intending to revise their program.	Majority believe there is significantly increased networking and collaboration, a much broader range of disciplines involved, increased cross-Canada and inter-institutional collaboration, and a significant — although not necessarily sufficient — increase in industrial focus. It was easy for most Chairs to point to specific examples of specific projects that would not occur without a network structure.	Overall respondents said that the scientific merit of the NCE research was very good especially in terms of collaborations, multidisciplinarity and better commercialization opportunities. A few individuals added that there was a real culture shift towards collaboration even outside of the networks. However, respondents believed that overall quality and productivity were essentially unchanged.	Respondents were split: several reported that there was an impact, especially in terms of increased contact with industry and collaboration. Others either did not know if there was an impact, or felt that there was none.

Issue	Network Officials	Chairs of Board of Directors	VPs of Research and UILO officers at headquarter universities	UILO officers at "node" universities
10./11. Value-added by NCE Program: (continued)				
On HQP	Changes re: access to other researchers and labs, increased networking for research and training, increased industrial exposure, etc. mostly due to NCE. NCE program has encouraged all networks to pay detailed attention to their graduate and post-doc training programs, often instituting entirely new programs — however, most benefits simply due to increased networking and applied focus. Limited data suggest network grads may show more willingness to collaborate and deal with applied problems than was true of earlier graduates with no NCE exposure.	All but two Chairs believed there were significant differences in training — the other two found no change, saying that lack of HQP was not a problem in their field. Chairs cited increased applied focus, collaboration, large group interactions, Canada-wide contacts, breadth of outlook, impact on prestige and career.	Respondents generally thought the NCE had been quite successful in providing high quality training to graduate students and postdoctoral fellows, particularly in terms of improving professional contacts, increasing networking, and increasing exposure to user needs. A few thought that the network had increased technical capability of research users, but most didn't know.	Just over half of the UILOs said that training of students was either not affected by the networks or they were unaware of any effect. Several UILOs said there was more networking of students with other academics and with industry as a result of the networks. UILOs were generally unaware of any impact on the technical capability of network partners or other research users or said that there was no impact. A few respondents thought there was some increase in equipment or staff numbers.
On knowledge and technology transfer	Networks found it easy to provide concrete examples of specific projects and/or applications (and in some cases, complete research themes) that would not have occurred without the network — generally because of the applied focus, support for disclosures and IP protection, and provision of contacts with users. In some cases additional impacts are due to collaboration and joint projects among partner firms that never occurred before.	Unanimous agreement that networks were better than traditional council programs, but cited strong influence of individuals in networks and universities. Chairs were uncertain how successful their networks had been at increasing the receptor capability of partner firms, but overall found there to have been modest impacts depending on sector.	See Issue 4	See Issue 4

APPENDIX G.1

NCE COLLABORATION CASE STUDIES OVERVIEW

1. Methodology For Collaboration Case Studies

This part of the evaluation was designed to investigate the nature and results of the collaborative process itself. Ten case studies were carried out, involving nine of the renewed networks. In five of the case studies, Scientific Directors or Network Managers were asked to recommend projects they considered particularly interesting in terms of the collaboration, for example because of the type of industry involvement, the achievement of critical mass, the extensive use of various technologies and so on. The other five case studies were chosen randomly: a random sample of theme leaders was asked to provide case study information for "their project", or to recommend some other project from their theme.

Within a given case study, as many of the principal investigators were interviewed as possible. Fifty-six respondents were interviewed, including:

- thirty-seven university or government researchers;
- nine industry representatives; and
- ten post-doctoral candidates or graduate students.

Seven of the projects had between four and five collaborators (including industry), while the other three had seven, nine and eleven collaborators each.

All of the respondents were interviewed by telephone by the same consultant. Generally interviews ranged from 30 to 60 minutes.

2. Collaboration Case Study Overview

2.1 Major Findings

Exhibit G.1 shows an overview of how results were distributed across the ten case studies. Some notes on individual categories are found below, while the detailed case studies are found in Appendix G.2.

Overall satisfaction with the collaboration

- Overall satisfaction of participants (researchers, students, industry) was high to very high in all but one case study, where it varied from low to very high among different participants. The most frequent reason for more lukewarm satisfaction was physical distance from the major collaborators.
- A High rating rather than a Very High rating indicates either that respondents were "quite pleased" rather than "wildly enthusiastic", respectively, or that only one collaborator was not completely happy about the collaboration
- The most frequent reason for more lukewarm satisfaction was physical distance from the major collaborators.

Benefits from the collaboration

- The collaboration provided benefits mainly related to different research perspectives, exchange of information, exposure to new research areas and technologies. Student training and industrial relevance were also improved.
- Industry representatives in particular mentioned that the project was a good opportunity for them to stay abreast of state-of-the-art knowledge by being associated with university researchers, they were able to do work they couldn't do otherwise because of lack of in-house resources, and the training for students was especially useful in that it provided industry with suitably-trained potential employees.
- In addition to the benefits listed on the table, industry representatives in particular also mentioned that the project was a good opportunity for them to stay abreast of state-of-the-art knowledge by being associated with university researchers, they were able to do work they couldn't do otherwise because of lack of in-house resources, and the training for students was especially useful in that it provided industry with suitably-trained potential employees.

Drawbacks to the collaboration

- The drawbacks mentioned of distance and time/energy cost were consistently seen as small inconveniences rather than major problems.
- A few industry representatives mentioned that they had anticipated problems (e.g., confidentiality issues and a perceived reluctance on the part of academics to do applied research), which did not in fact materialize.

Exhibit G.1: NCE Collaboration Case Study Overview

Case Study	1	2	3	4	5	6	7	8	9	10
Overall Satisfaction with collaboration	High	Very High	High	High	High	High	Very High	High	Low - Very High	Very High
Benefits from collaboration										
Exposure to different perspectives			4	4	4	4		4	4	4
More information exchange	4	4		4		4		4	4	4
Exposure to new areas of research	4	4		4		4			4	4
Exposure to new technologies		4			4	4				
Student training/hiring is better[1]		4	4				4			
Industrial relevance is higher			4			4	4			
Size of research team is larger			4							4
Drawbacks										
Distance makes it difficult	4				4			4	4	
Time and energy cost		4	4							
Did team act as true Collaborative Unit?	No	Yes	Yes	Yes	No	Medium	Yes	No	Yes	Yes
"Odd Man Out": Were there problems with one person or research area being too remote?	4					4			4	
Degree of Contact Within Project	High	Medium High	High	High	High	Medium High	High	Medium High	Very High	Very High
Extent of Collaborations Outside Project (e.g., across other themes/networks)	High	High	High	High	Medium	Low	Medium	High	Medium	High
Degree of Student Involvement	High	High	High	High	High	High	High	Medium	Medium	High
Attitude Change because of project										
Towards Academic collaboration	+	+	+	+/–	+		+	+	+	+
Towards Industrial collaboration & applied research	+	+	+	+	+	+/–	+	+/–	+	+
Interdisciplinarity	Medium	High	High	High	High	High	Low	Low	High	High

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[1] Perspective of non-students.

Extent to which the research group acted as a true collaborative unit; and degree of contact within project

- Respondents were asked explicitly if they thought the project members had operated as a true collaborative unit. As can be seen from the table, six groups said they did, but four groups believed they had not been, or had only functioned moderately well as a unit.

  The reports of the actual amount of contact they had, however, show a different picture. All of the groups had significant and frequent contact in person and by telephone or e-mail (often several times daily, weekly or monthly). They also reported a "suitable amount" of contact depending on the particular needs of the study at a given moment in time. There was almost always a fairly complete exchange of information, data, results, protocols and materials. While all members of a given team did not necessarily communicate equally often with each other, and three or four groups operated more as a "hub and spokes" collaboration, the investigators generally seemed to be in contact with the right people to the extent necessary to carry out the study.

  Our interpretation of these data is that the four groups with lesser collaboration — while not perfect — did in fact collaborate "well enough".[1]

- Almost half of the industry representatives reported that they had somewhat limited — but still quite satisfactory — input into the collaboration. They said that they did not want to control the research too tightly, instead preferring to express their concerns and interests and then allowing the researchers to proceed with their plans and research.

Extent of collaborations outside individual project

- In NCE investigators can collaborate within their individual research project, as well as across network research themes. Both aspects were investigated.
- There was a great deal of collaboration taking place outside of the particular projects under investigation — i.e., with members of other projects in the same network theme. Often the researchers who were less involved in one particular "case" project were involved to a much greater extent in other projects and collaborations.
- Many of these collaborations extend out to other projects and themes in an ever-widening spiral.

Student Involvement

- The table reports only on the perceptions of the non-student members of the collaboration. Please see the separate section below on student perceptions.

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[1] We have found similar perceptions in other studies of collaboration; e.g., in the evaluation of the International Human Frontier Science Program, some HFSP investigators seemed to define "true collaborative unit" as requiring frequent personal contact between group members, coupled with carrying out work on the same part of the project. We believe this is unnecessarily restrictive.

Attitude change towards carrying out collaborative or applied research

- Generally the NCE experience cause the large majority of respondents to become more positive towards academic collaboration, collaboration between university and industry, and doing applied research.
- In the Exhibit, a "+" generally means that one or more of the project members said that their attitudes had become more positive — often quite significantly — towards collaboration, while the remaining members said either that their attitudes hadn't changed or (as was more often the case) that they had always felt positive towards collaboration.
- The one "-" rating for collaborating within academia refers to the difficulty on a large scale project, (not in fact part of this case study) of understanding each other across disciplines.
- As may be seen, most respondents reported that they had become more positive about collaborating with industry. Of the two negative ratings, one represented a minor concern, in that the investigator said he hadn't become as positive towards it as he had hoped he would. The other was far more serious in that the investigator was quite negative about industry's concern for profit and short-term goals.

2.2 Student Perceptions

Background

Six graduate students and four post-doctoral candidates who were part of the projects evaluated in the collaboration case studies were interviewed. Their comments are included in the detailed case studies (as are the opinions of the network and industry researchers regarding training); here we summarize the views of the students themselves.

Value Added of Collaboration

Students were generally very positive about the collaboration, with eight of the respondents rating it as very good or even great. They cited the ability to work or be trained in other labs, the opportunity to collaborate with students from other labs and the multidisciplinary approach to research as the major reasons for this enthusiasm.

> *"People in the other labs were friendly and eager to teach me."*
>
> *"I learned from the best in several different disciplines."*
>
> *"The network as been very different from classical graduate studies which my friends are in — NCE is much better. I'm working with other students and working towards the completion of a system with real applications. NCE is creating a much better environment, especially from an industrial needs point of view."*

Respondents reported that they had joined the project because of their advisors' involvement or because the topic was of interest to them. A few also said it would open doors for them for their future.

The students' opinions as to the major benefits of collaboration were not much different from those of researchers. They liked the opportunity to gain expertise from the best researchers, to broaden their views, to be exposed to whole new areas of research, and have access to good equipment. They were especially enthusiastic about the opportunity to learn techniques at other labs and core facilities.

The only real drawback seen was some extra time required to coordinate and meet with everyone.

Nature of the Collaboration

Overall the data confirm that students have more interaction, and more diverse collaboration, with other researchers than is normally the case.

Most students were in constant and full contact with their advisors, but in addition over half reported that they were also in contact with students at other labs for technical and information exchange. Over half also reported attending regular weekly meetings with at least one P.I. and other members of the lab, but often including more than one P.I.

A few students also reported collaborative contact with P.I.s other than their advisors, contact with industry and multi-day visits to other laboratories. Several students were engaged in collaborations with other members of their theme, other themes in their network, and even one other network.

Students also commented on the high quality of the NCE courses.

Significant industry involvement was also reported by just under half of the respondents.

> *"Industry saved me time by giving me materials and I will be visiting another university in the U.S. to learn how to use their equipment."*

Four of the students reported that they were fully involved in the collaboration with the exception of the actual planning process, while two others were also involved in that level of collaboration. Three students said they focused more on their own project. Only one had very little to do with the collaboration.

Influence on Attitudes

The majority of those interviewed reported that they felt much more positive about collaborating within academia as a result of working with the network.

> *"It's been a very open environment. People have willingly shared with me with no delay and with no fear of being scooped. I have a very positive view of collaboration."*
>
> *"Certainly. Collaboration has allowed me to learn so much more than what I expected. It's so limited when you work alone in one lab. Now I'll seek other people in different specialties to collaborate. Their ideas are wonderful. Everyone has different perspectives. There's not only one way to do something. There are so many different ways."*

One student said that while he did in fact feel somewhat more positive about collaboration he was also more cynical about it and the gamesmanship involved for granting purposes.

A few students said their attitude towards collaborating with industry and government labs had also changed.

> *"If I have a new problem (I used to only have secondary data), now I'll contact government or industry for masses of data and information. I've learned how to do it."*

Over half of the students said they were more positive about doing applied research and had learned a great deal about it from working in the network. A couple of students spoke of seeing the whole issue of basic vs. applied research as a continuum now, rather than as opposite approaches.

> *"I used to think of it as separate. Now I see it as a progression and it's good if a lab has both. It can bring in money for the lab."*

From the opposite direction, some students were now more interested in doing fundamental work.

> *"I always wanted to do applied research — I used to think research had to be about finding a cure. But now I see basic research as providing the stepping stones with a goal to application at the end. It ties it in from an earlier stage."*

Program Success

Most of those students interviewed thought the network and the NCE program was very good and even "the best."

> *"The network is very good. It's wonderful support, a great project. The network supports good work and it's a good system for students."*

> *"The program's a very good idea. The network was a very positive experience and it produces very good people. It has generated a very different attitude. Those people just now are entering academia and industry and things will change drastically as a result."*

Over half of the students cited the network meetings and the network courses as one of the most valuable aspects of the network.

> *"Expand the workshops. The small programs and training are very successful! It's the strongest aspect of the networks."*

> *"At the meetings people are enthusiastic and setting up collaborations even with industry. It's well set up for students, quite good. It has excellent courses and the students know each other from annual meetings. That's good!"*

> *"I'm thoroughly enjoying the network and taking advantage of it. At the annual meetings I talked to lots of people and exchanged a lot of names. Meetings like that are important to grad students. There is research open to you wouldn't know existed."*

Suggestions for changes included adding more meetings and communication, adding more industry involvement, expanding the number of workshops, and including more female researchers and students.

APPENDIX G.2

DETAILED COLLABORATION CASE STUDIES

NCE Collaboration Case Study 1

Background

This project includes five university collaborators, four of whom are in one institution, plus one other at an institution in a distant province. All of the primary investigators and one graduate student were interviewed. Four of the investigators had had previous collaborations with each other.

A spin-off company that is indirectly related to this project is being formed.

Value Added of Collaboration

Investigators were quite positive in their overall feelings about the collaboration. Even one respondent who felt that collaboration had been "forced" on them by the network had come to "really like it".

> *"I am extremely supportive of it and extremely lucky that I started my career when NCE started. I've been able to do things I would never, never, have been able to do without the collaboration."*
>
> *"The strength is that we are talking all the time which probably wouldn't have happened otherwise. We are plugging into each other's work."*

While a few respondents cited the additional funding available as one of the reasons for entering the collaboration, several also said they were motivated by the desire to meet and be in contact with large numbers of researchers in their field and have access to their expertise and technologies.

> *"I had the desire to be part of a group and not be isolated, and to collaborate across Canada."*
>
> *"You get to know everyone in the area instantly. If there is a major development in your field you are either part of it or no — I wanted to be part of it. It wasn't really the actual project, it's the general intellectual association with all the people and how that affects everything you do."*

The exchanges of information, expertise and new technologies were cited as the major benefit of collaborating, as well as the introduction to whole new areas of research and resulting major changes in the direction of research. One investigator said that 50% of the work in her lab was now devoted to an entirely new area of research which she became exposed to via the collaboration.

Most researchers reported that there were **no** significant drawbacks to the collaboration. Interestingly, the one investigator who did have a couple of moderately serious comments was the one who works in a different province from the rest. Those comments included the difficulty of keeping things going over such long distances, and the need for someone to take the initiative to monitor progress even for lower priority items. He also objected to the fact that there was a suitable expert (in his opinion) in his building who was not in the network, forcing him to use an NCE expert across the continent.

Nature of the Collaboration

Generally participants did not think they had operated as a true collaborative unit. They reported that they were operating independently, each of them working on their own separate project. One investigator suggested that they should have been communicating more.

However, the description of the nature and frequency of the contact they actually have (in the one institution where four of the PIs work) presents an entirely different picture. Investigators reported daily personal contact about the project, at least on an informal basis, including contact with other investigators as well as with students and technicians from the other labs. They also reported meetings with other investigators, students, postdocs and technicians two to three times a week, as well as full and total exchange of information, results, materials and presentations, plus ongoing planning, design, problem-solving and progress update discussions. They are also publishing joint papers.

Some of the discrepancy appears to relate to the perception that they are sharing intellectually but are not collaborating since they are doing independent experiments. They have also published papers that are only under their own name "so the outside world doesn't see it as collaborating".

The amount of contact between the two different institutions is dramatically lower than that in the institution where the four PIs work, and appears to be mostly at Network and Theme annual meetings, although with some regular but infrequent phone and e-mail contact. To some extent this is due to the distant collaborator's role (which requires other parts of the work to be completed before his part begins), as well as to the distance involved.

Collaboration outside the group

All of the collaborators are engaged in significant collaborations with other non-group members of their network, both in and across themes. These projects involve extensive research by the PIs as well as extensive student visits to other labs.

At present there are no formal arrangements with industry, although there has been some exchange of materials and a student is being funded to go to a company, work in their lab and see if there is a useful technology available. One or two of the collaborators may start a company of their own that is indirectly related to this project.

Student involvement

Student involvement in this project appears to be significant, although their roles are different depending on the specific PI they are working with. Half of the major investigators reported that their students had total involvement in the project that included massive and "seamless" interaction with the other labs, with full input into all aspects of it. The others saw their students as doing a large part of the project work but having limited input and involvement in the collaboration or in the planning and design of the work.

Impacts on Applications

Three investigators felt that NCE had a positive impact on their attitude toward collaborating within academia.

> *"My whole way of doing research now is collaborating. It's a whole culture. My students have no hesitation calling anybody to get expertise, information and reagents. It opens incredible doors."*

A different combination of three investigators saw a change in their attitude to industry.

> *"It has been threatening to see industry previously — as if they would take over my work. I would have been nervous that I would lose control of it. It was a naive point of view — now I know you can set up the research legally and contractually to protect yourself."*

> *"Now students don't see anything wrong with industry collaboration. A lot of leading edge work is being done there, published in real journals. They now have a fear of being academics alone in their lab with no one to talk to."*

A couple of investigators reported that they were more positive about the idea of doing applied research.

Interdisciplinarity

Three collaborators saw the project as involving significant interdisiplinarity, involving a molecular and systems approach tied together on the same team.

> *"In order to understand the molecules and how they work, they need to be looked at the protein level, the DNA needs to be manipulated and the physiology has to be examined."*

> *"It brings together different approaches and more techniques to bear on it. The project couldn't have been done otherwise."*

NCE Collaboration Case Study 2

Background

This project includes five university collaborators, three researchers from government laboratories, and one industry member. Four of the university collaborators and the industry member are in one institution while the other university member is at an institution in a distant province. Two of the government facilities are in the same city but distant from the university with most of the PIs. The other facility is in an adjacent province to the university with most PIs. Interviews were carried out with two of the university investigators from the same institution, two of the government investigators, the industry representative and one graduate student. Most of the investigators didn't know each other previously or had met just prior to the collaboration. Only two had collaborated previously.

There is a possible major economic impact associated with this project through product sales.

Value Added of Collaboration

All of the collaborators were extremely enthusiastic about the collaboration, saying it "had to happen", it's "great and not do-able without it", and "it's the best quality research". Even the industry representative said it was the best collaboration he'd ever been involved with and he "couldn't be happier".

Some collaborators had previously been involved in this area and were interested in going further with it, so joined the network in order to do so. Some initial discussions about the research took place at an NCE Annual General Meeting. The participants saw that it was a "total fit", with "great science" and technology that would be extremely useful, as well as very commercializable.

Access to and exchanges of information, expertise and new technologies were cited as the major benefits of the project, as well as the introduction to whole new areas of research they were previously completely unaware of.

> *"There is lots of stuff I am doing today that I would never even have dreamed of before ."*
>
> *"It enhances your scientific capability, filling in gaps and looking at different parts."*
>
> *"It's added a new dimension to my work and feeds on and from other projects. The science is much more sophisticated."*

Respondents also cited major benefits from the ability to add extra people to the lab, and training students who worked in industry after graduation..

The industry representative said it was important to be very careful about the individual scientists you are working with: value added comes from the outside expertise only if the individual is good and willing to stay on track with industry concerns.

While two of the respondents said there were **no** drawbacks, others were a bit concerned with the amount of energy the collaboration takes and the difficulty of staying fully informed. The difficulties of collaborating from a government lab was a point of concern for one investigator — this respondent raised issues related to divided loyalties, means of taking credit for the government lab, sharing of intellectual property between the network and the government, and the need to deal with potential conflict of interest situations with individuals within his lab (since they could not all have access to NCE results).

Nature of the Collaboration

Participants said they did operate as a true collaborative unit.

> *"We're interdependent. If one doesn't do their job the project doesn't get done."*

To some extent — although by no means completely — the interaction of this project follows the "hub and spokes" model of collaboration with the project leader having almost all of the contact with industry and with the representatives from the government labs. That interaction generally consisted of monthly e-mail or phone contact with the labs and weekly to monthly meetings with the industry rep as well as phone or e-mail contact two to three times a week.

Collaboration among the various university researchers was extensive, with subgroups having major amounts of contact with each other as well as with the project leader and even with geographically distant members of the group. The two investigators from the same university (one of whom is the project leader) are in constant daily contact while two of the cross-continent researchers (not including the P.L.) have weekly contact, and have had several student and post-doc exchanges for up to ten-day periods.

Collaborators reported that there was a full exchange of information, results, ideas and material among all participants. There appears to have been only one meeting (at the network's Annual General Meeting) at which all of the participants met at once, but there have been somewhat more frequent meetings of significant subgroups of investigators.

Collaboration outside the group

All of the researchers (except for the industry representative) have had significant and numerous collaborations with other non-group members of the network, including within this theme, across the other themes, and across other networks.

There is some preliminary contact with other companies currently under way.

Student involvement

The university researchers have had extensive postdoc and graduate student participation in the project through research planning, project work, weekly lab meetings of investigators and students, and sometimes even participation in the patenting process and attendance at the annual NCE meetings.

> *"It shows students there is a life after school. There are lucrative and challenging jobs available because of the industry contact and commercializing. There is value in intellectual property."*

> *"I keep grad students out of the commercialization process, however, because it's too much pressure."*

Impacts on Attitudes

Most of the collaborators reported that they had always had a strong positive attitude towards collaboration within academia although one person added that the NCE facilitates the process. One collaborator said that the NCE made it easier and that he was more willing to jump into the project. He added that there's no choice anyway because he can't be a network member otherwise.

The NCE had a major influence on researchers' attitudes toward collaborating with industry. They reported that the program has made it easier and more legitimate to work with the private sector and that they have learned "how to approach companies and how to deal with them. There has been good training from NCE."

> *"I now think it is an essential part of doing business in science. I was naive before about what it takes to develop products but I wanted to make a difference. Because of the NCE training course [in IP protection] I am more circumspect about the safeguards and how to protect myself from wolves."*

Interdisciplinarity

Respondents said that the project was quite interdisciplinary and included a "hodgepodge of different approaches". The project leader in particular reported that the full project required "extreme expertise that he couldn't do without fifteen years of training".

NCE Collaboration Case Study 3

Background

This project includes three university researchers at the same institution and one industry collaborator headquartered in a nearby province. All of the senior collaborators plus one graduate student were interviewed. None of the collaborators had worked together prior to the project and some had not even met. One project member had only joined the project within the last two months.

This project may have significant ___ impact.

Value Added of Collaboration

The three university collaborators were quite enthusiastic about the collaboration, while the industry representative said that he had not had much involvement with it.

Reasons for joining the project included additional funding, being hired for a university position which included working on the project, and a strong positive feeling about the chance to do research in Canada that was seen to have serious industrial potential. The industry rep felt there was strong potential of applications for them and for the training of students as potential employees.

Researchers said that the collaboration was "essential because it was too large and diverse to do it alone". The project broadened perspectives and made the work more relevant.

> *"The collaboration with the company injects it with realism and with a true understanding of what the company requires."*

The industry rep reported that it provided his company with the opportunity to keep aware of the research possibilities.

Some extra overhead in terms of time and administrative load was seen as the drawback of collaboration by university investigators, while the industry respondent said found the collaboration unsatisfactory because they weren't able to supply manpower or participate in the research. An indirect benefit however, was the opportunity to end up hiring people.

Nature of the Collaboration

All of the collaborators said the team members operated as a true collaborative unit. The industry rep said he was satisfied with his input concerning industry interests and that he had persuaded the network to look at the things he was interested in. Researchers were in daily contact with each other and participated in weekly formal meetings with the three investigators as well as regular meetings with some of the other investigators and all of the students. Collaborators reported that there was a full exchange of information, results, ideas and material.

Contact by phone or e-mail with industry is maintained by two of the investigators on a monthly basis and there are meetings every three or four months (although those appears to take place more frequently with only the project leader and the company rep present).

Collaboration outside the project

Two of the university respondents and the university rep have constant and ongoing collaborations with other projects within the theme.

Student involvement

Students and post-docs are involved in almost every aspect of the project excluding only the "vision and major planning". The industry rep said they end up hiring many of the students and there are numerous arrangements to have students training at their lab.

Impacts on Attitudes

All of the respondents said that they were always fans of collaboration with academia and industry, while one respondent added that NCE had made him feel even more positive about it.

Interdisciplinarity

Respondents reported that the project was completely interdisciplinary and that that was necessary to build a system that includes a multitude of technologies which need to be integrated.

NCE Collaboration Case Study 4

Background

This project includes two university researchers at the same institution, one researcher from a government organization, and one private sector company rep, all of whom are located in the same province. All of the investigators plus one post-doctoral candidate were interviewed. Half of the collaborators had worked together prior to the NCE.

This project has significant potential impacts related to economic benefits, industry practices, and government regulations.

Value Added of Collaboration

Project members were quite pleased with the collaboration. The project is joining with, and expanding into, a much larger project. The expanded project has presented some concerns for the researchers such as the language barriers across different network themes and disciplines, additional cross-over to industry, and concerns over the short-term and uncertain nature of NCE funding for what will necessarily be a major and long-term study.

Scientific interest and the complex nature of the research (which necessitates an interdisciplinary approach) were cited as the reasons for joining the collaboration. The industry representative reported that his company could not possibly "muster nearly the necessary talent to do the work alone".

Researchers felt that the collaboration was "opening up the narrowness of the area" and increasing their knowledge base. There was particular emphasis from these researchers on the increased understanding of other disciplines and sectors.

> *"I have more understanding of the problems other disciplines have getting data and the ways we have to discover how to solve these problems. I'm also getting a better idea of what is really relevant."*
>
> *"I'm learning a lot about this other area and the different perspective they have. I now have more respect for their views."*

The industry representative was most pleased that the one question they had proposed at the outset of the project — then left open-ended and in the hands of the network — had broadened into so many aspects. He considers it an "ideal arrangement".

It appears that the project expansion is responsible for the drawbacks cited by researchers: the time, energy and complexity needed to deal with the other researchers has caused some problems. "Getting through the barriers" of the other areas and "trying to figure out how to fit it with the larger group" has been challenging for them.

> *"The process of collaboration means working out different underlying assumptions, definitions, etc. We'd already collaborated before this project so it wasn't a problem, but on the larger project across the different themes we're just starting out. We're not as advanced in understanding each other."*

The industry representative said that since it was the company's first exposure to the scientific community it has been a learning process and "the meeting of two fundamentally different cultures with different time frames". He added that he thought there would be a reluctance on the part of the network to focus on applied work but that this hasn't been the case.

Nature of the Collaboration

All of the collaborators thought they had functioned as a true collaborative unit, although one investigator thought perhaps that the industry representative just didn't have the tools and techniques, the general expertise, to do so effectively.

> *"Industry articulates and outlines broadly what should be looked at, then looks to us to figure out what and how to do it."*

The industry representative, on the other hand, was quite satisfied with the level of their functioning as a collaborative unit.

> *"Absolutely. We're a planning team and we've worked together on the design."*

The two university researchers are in "constant and continuous contact up to five times a day" with each other and both reported extensive contact with the government researcher at least by phone or e-mail; the government rep also indicated extensive contact with them (although to a somewhat lesser degree). The university researchers share everything while the government rep said that the work was somewhat separate — however, they *were* constantly sharing information and discussing their work.

Personal contact with industry appears to take place about once every one or two months with additional phone or e-mail contact about every two to four weeks. All of the researchers seem to have more or less the same amount of contact with industry.

Collaboration outside the project

All of the participants are collaborating with a larger group that includes NCE researchers from inside and outside their own theme as well as several different representatives from various companies. There are some other collaborations taking place as well within the theme.

> *"Its nice to ask other themes where to go for the information and also to have access to industry data bases."*

Student involvement

One of the university post-docs is seen as one of the principal investigators on the project and participates at all levels. Other graduate students "work together a lot". The researchers also share a post-doctoral student between both locations and have graduate students shuttling back and forth between the university and government research labs. A post-doc will probably be hired on to the government lab staff.

> *"Graduate students are starting to develop connections with other students (from other labs)."*

Impacts on Attitudes

Two of the researchers reported that the NCE had changed their attitude toward doing collaborative work, but differed in degree . For one researcher it confirmed the difficulty of working across disciplines (on larger collaboration), but said it's still changing his work in a positive way. The other researcher was more positive, saying that the NCE had given him more opportunity to sit with others from his area.

The same two researchers felt that their attitude toward working with industry had improved, both in terms of getting to know and understand industry approaches and concerns better, as well as by "being impressed by industry's willingness to listen".

Interdisciplinarity

All of the respondents reported that the project was interdisciplinary and that that was the point of the study.

> *"The work is only partly relevant unless you understand the other disciplines."*

The industry rep said that the interdisciplinarity was the key thing about the project.

> *"The results are not nearly as defensible without it. Research in this area is generally uni-disciplined. It is as much one area as the others. This is the full range.*

NCE Collaboration Case Study 5

Background

This project includes seven university researchers in seven different institutions in several provinces. At least four of the participants work at NCE Core Facilities. Two others started out as post-doctoral students of the project leader then went on to other positions where they continued the collaboration. Four investigators and one current post-doctoral student were interviewed. There was only one collaboration between two of these investigators prior to the NCE.

There is a potential pharmaceutical application for this case study.

Value Added of Collaboration

Three of the investigators had strong positive feelings about the collaboration: e.g., the project leader called it a "massive elevation in the nature of his research", and one of the ex-post-docs said that the work extends past the network. Only one of the researchers (at a core facility) said that he had mixed feelings about it, in that he had only minor exposure to the study and was restricted to carrying out the technical work of the facility for the project.

The two reps from the core facilities entered the collaboration because of the science involved while the project leader said it was the chance to work with people from different fields. All of the respondents were consistent in echoing the value of exposure to new technology as the primary benefit of the collaboration. The opportunity to be exposed to new and different ways of thinking from different fields and the chance to stay very aware of Canadian science were also cited as benefits.

> *"It was immediately visible that the real catalyst from NCE was the new technologies."*
>
> *"The core facilities and different technologies available from those who have a vested interest in helping means you can do all sorts of science you couldn't do otherwise."*

The distances involved and the potential conflict over the overlap of experiments were seen as two minor drawbacks.

Nature of the Collaboration

Only the project leader thought they had operated as a true collaborative unit. The two respondents from the core facility saw their role on the project strictly as one of providing the appropriate technologies. Even the ex-post-doc said that they operated as "independent pegs in a unit" then added:

> *"This was technique-oriented rather than topic-oriented. The reason for the collaboration was about a technique."*

This project appears to follow a strictly hub-and-spokes model of collaboration. Even the project leader said that he had "picked up people as he went along". Generally it was mainly the project leader who was in contact with each of the other investigators, except for more general gatherings at annual NCE meetings. The PL's contact with the collaborators has been extensive, however, including phone and e-mail contact anywhere from 2 to 3 times a week to twice a month, depending on the particular stage in the research and the specific aspect of the project involved. There has been a massive and constant exchange of materials between the various labs.

Collaboration outside the project

All of the respondents have extensive collaborations with various other members of the network within and outside of the theme, both in the role of providing core facility expertise as well as working on their own collaborations. The project leader added that "new collaborations keep evolving all over!" The project leader added that he was in preliminary contact with some large private sector companies.

Student involvement

Both graduate students and post-docs have trained in at least one core facility for two week periods. Both the project leader and the ex-post-doc said that students were totally involved in the project, both in the design aspects and the research itself.

Influence on Attitudes

All of the participants indicated that their attitude towards doing collaborative research within academia has been enhanced by the NCE.

> *"The network provides the easiest collaboration to do. There is support for student lab visits to learn technologies — It's the most useful aspect of the NCE. I have more understanding of what a good collaboration can be. I've learned a lot."*

Three of the respondents said that their attitude toward collaborating with industry had also been greatly enhance by their exposure to the network.

> *"I had no prior awareness of industry or access to it. I have much more now. I see them as part of the research community with a very different approach and it's very stimulating. I also see them as a place for students."*

> *"I'm much more positive. I got to interact with industry and got pushed toward industry funding. I thought it wouldn't be basic but now I see they are open to basic research. Even my in-house work for industry is far more basic than I expected."*

Researchers' attitudes toward applied research has also changed.

> *"My attitude was much starker [before]. I thought industry research was only profit-oriented and I didn't see researchers as decision-makers."*
>
> *"It's been an education to see how that research evolves. I've developed a positive attitude because of it."*

Interdisciplinarity

Respondents said their work was definitely interdisciplinary and involved the ability to generate the model, study it, identify the problems, then understand the causes of those problems using different fields of research.

NCE Collaboration Case Study 6

Background

This project includes three university researchers, one of whom also works at a hospital, and one rep from private sector company. Two of the researchers work at one university which is in the same province as the company. The other university is in a distant province. All of the university researchers, two representatives from the company (an administrative contact and a researcher), and one investigator (who was a post-doctoral student but is now working in industry in the U.S.) were interviewed. There was only one low-level collaboration prior to the network.

Value Added of Collaboration

The industry researcher said that it was a very positive experience for his company, that the science was ***very*** useful, and that the project had provided consultancies, services and inroads to academia that they wouldn't have had access to otherwise (or would have had to pay a great deal for by contracting out). Only the collaborator from the distant university did not feel completely positive about the interaction. While he did say the group's work supported and complemented each others', he added that he "feels the lack of their physical presence" and that it was a challenge to be part of the group.

The major university collaborators were invited to participate by the network administration, being interested in the science and the equipment available, while the industry administrator commented on the "great equipment" available in the university lab.

The perceived benefits of collaboration were more diverse than in some of the other case studies, and included the opportunity to go in new directions; the chance to get otherwise unavailable information; the opportunity to get specific products from industry; and the opportunity to have nation-wide connections, state-of-the-art equipment, and to be a "bit more goal oriented and closer to application". One of the collaborators added that they had "good free reins from industry to do what they wanted." The industry administrative representative said that the major benefit was the chance to have access to experts and hopefully to have "first dibs" if something comes out of the work. The industry researcher was very enthusiastic.

> *"The network gives us several more people to look at the science, formulate the approach and exchange ideas with well-respected scientists. We can acquire some technologies through the network and gain information on products they're working on from labs whose specialty is to look at those products."*

However, the industry administrator said that the major drawback was not physically being in the labs, which means that the researchers do what they want, not what the company wants. [Note that the industry researcher and administrator disagree somewhat on this matter.]

Nature of the Collaboration

NCE Collaboration Case Study 7

Background

This project includes one university researcher and three company reps, one of whom has just recently joined the project. The researcher, the two company reps most closely involved in the project, and one graduate student were interviewed. (The rep from the firm that recently joined was not interviewed.) One of the companies is in the same province as the university and the other is in a nearby province. The researcher had full collaborations prior to the NCE with both companies.

Value Added of Collaboration

"Very very useful", "going very well", and "going exceptionally well" were the ways the collaborators described their feeling about the collaboration. While the university researcher said that he joined the project because it was an area he was interested in, one of the industry reps said that through the network it would cost them one-third of what it would take to do it alone, and the other industry rep said that otherwise the work could only be done outside of Canada.

Both the university respondents and one of the industry respondents, said that training students and getting to know them well, especially in areas relevant to industry, was one of the primary benefits of this kind of collaboration. Other benefits cited by the industry representatives include

> *"It helped give us a time table for our products for the next three years, and it gets more people working on the project from both university and industry. The university has a more state of the art knowledge because they stay abreast of publications. Industry brings knowledge of what practical applications are needed — these push the university research envelope."*

The main drawback of collaboration (cited by one of the industry reps) was the issue of property rights. The other company had similar concerns, adding that timing issues affected this:

> *"You have to chose the project carefully at a truly pre-competitive stage because you're sharing the collaboration. You don't want to have to pre-empt that work by doing the in-house work too early because you have to get it into production."*

Nature of the Collaboration

"As good as it gets" was the sentiment of all the participants when asked if the team had functioned as a true collaborative unit. Neither company wanted to control the project too tightly. They wanted "certain research directions and training of students" as the important outcomes.

> *"We suggested the technical goals and suggested the university do the planning. The project leader is good at it. He knows how to make it happen."*

> *"There is active participation from industry."*

The project leader has at least weekly contact by phone or e-mail with both companies and he sees them monthly. The three of them, plus students and technicians, have all met together three or four times. There appears to be a great deal of contact between the students and technicians at the different labs and they are planning to have graduate students work at the industry labs for two to three week periods. There is a total exchange of results, tools and materials.

Collaboration outside the project

The project leader has some exchange of information with other members of the network, especially at NCE meetings and workshops. Both companies support several other projects within and across themes but the actual collaboration there is at a much lower level.

Student involvement

Students are seen as the main means of carrying out the work by the university researcher. Both companies reported that they were in regular and extensive contact with them. Student have visited the labs and given presentations at the companies.

Influence on Attitudes

While all three of the participants have always collaborated, one researcher was especially enthusiastic about what he has learned from this particular experience.

> *"It opened my eyes to the benefits of collaboration in a much more open forum. It promotes the leveraged use of intellect at various universities. Universities used to have individuals that competed in narrow areas. Now they collaborate and universities have a whole group of expertise. These are useful centres."*

All three of the collaborators were very positive about the change in their attitudes towards working with industry.

> University researcher: *"It brought a much broader perspective and interactions with many more industries. Now I can interact because I'm part of the network. Distance is much less of an issue."*
>
> Industry: *"I was surprised at how far you can go with other companies. It's broader in scope and extent than other collaborations."*
>
> Industry: *"I am much more open to discussing vague product plans, and sharing costs. Money is tighter now for research and now the opportunity exists with the NCE meetings as a forum which encourages cross-fertilization. I would never have done this five years ago."*

Interdisciplinarity

This project is not particularly interdisciplinary.

NCE Collaboration Case Study 8

Background

This project includes five university researchers, which includes two co-project leaders at one institution, the third at a university in the same province, and two more at the same university in a distant province. Four of the collaborators and one graduate student were interviewed. All of the collaborators had some small amount of low level collaborations prior to the network study.

No practical applications are foreseen at this time.

Value Added of Collaboration

All of the respondents were very pleased with the collaboration. They were quick to point out that this project was somewhat unusual in the network in that it was a fairly loose and primarily-theoretical collaboration. Investigators said that it had benefited them a great deal in their work. It is apparent that it was the particular group of individuals and their specific approach to related work that was the reason that these collaborators entered into the project.

> *"We were all doing similar things [earlier] with different approaches. It was a good idea to start thinking about how things combined."*
>
> *"These were people whose work I respect and I keep up with their ideas to feed into my work."*
>
> *"Shared interest with different approaches to similar problem."*

The major benefits of this collaboration are the broadening of perspectives of "similar subjects and the opportunity to get valuable feedback" and a deeper understanding of the work. The distances involved caused some small difficulty.

Nature of the Collaboration

The team does not operate as a collaborative unit in terms of planning but this is not seen as a drawback.

> *"It's not a centrally planned unit. It's people discussing ideas and bouncing ideas back and forth, building up a body of knowledge and drawing ideas together. The local parts are being pushed by the collaboration, rather than pulled."*

Not surprisingly, the two pairs of investigators at the same institution are in daily or weekly contact with each other, including official group meetings with students, some of whom are co-supervised. The fifth investigator had a year-long sabbatical at one of the institutions and so was also in intensive contact during that year. On average, several members of the collaboration meet three to four times a year on visits or at network and NCE meetings. The various collaborators are in phone or e-mail contact between once a month and once every three months. There is a full exchange of information, data and results.

Collaboration outside the project

Three of the investigators are actively engaged in collaborations with other network members both inside and outside of the theme, while the other respondent has ongoing exchanges of information and ideas with other members of the network but no actual collaborations.

Interestingly, while all of the collaborators referred to this project as theoretical, there has still been some work done for a government agency, contact with a crown corporation, and inquiries with at least two private sector companies.

Student involvement

Students of three of the collaborators have a significant role in the work, including some planning. One of the investigators said that his students collaborated frequently and independently with other NCE projects.

Influence on Attitudes

Three of the collaborators felt that the NCE had improved their attitude towards collaborating within academia.

> *"I want to do more collaborating. It's very interesting and positive to do it with the right people."*

> *"Yes. It made me much more aware of talking to people in sub-specialty areas and thinking about a wider range of things and putting them together. This is getting people to talk to each other who normally wouldn't."*

Two of the investigators thought there was change in their attitude towards collaborating with industry but in one case "not as much as he had hoped".

> *"I've got much more willingness to do it if the receptor capacity is there. There really is much more atmosphere of getting out and doing it with industry."*

Two different collaborators felt there was some change in their attitude towards applied research, although in one case, only a little.

> *"I'm more positive about applied work. I see some of the potential of our ideas. I'm quite excited about some of the uses industry sees for it. Students like it a lot better. They get very excited when they see direct applications."*

Interdisciplinarity

There was vague disagreement as to whether the project was interdisciplinary, with one respondent saying that "the work is, even though the people aren't". One investigator said they were entering different disciplines through "the back door".

NCE Collaboration Case Study 9

Background

This is a massive clinical trials collaboration that includes nine researchers from university or hospitals (or both), plus two private sector companies. The investigators are in five different provinces with the large majority working in three provinces which are close to each other, and the others each working in separate provinces distant from the others. Five university researchers, one industry representative, and one post-doc were interviewed. Some of the researchers knew each other prior to the collaboration, some had not; and some, but by no means all, of the people had been involved in various levels of collaboration with each other prior to the NCE project.

This project has potential economic, health, and social impacts.

Value Added of Collaboration

General feelings about the collaboration were quite scattered, from highs of "extraordinary" and "excellent"; to "not bad"; and to a low of "the project was difficult to initiate because of different attitudes — that was very hard to deal with." It may be of interest to note that the latter respondent, as well as the collaborator who said it was "not bad", were the two investigators from distant provinces. The industry rep thought it was "working out very well" and he was "quite impressed".

Most of the investigators joined the project because they were already doing, or were interested in doing, work in this scientific area. One respondent mentioned that he loved the applied dimension. Industry was interested in broadening the application of its products.

The advantages seen of collaborating were numerous, with the major ones being the opportunity to have a large variety of expertise which challenged them, and forced them to rethink basic issues, excellent communication with significant intellectual exchange of ideas and more input into the project, allowing them to advance to the forefront of the field. A few collaborators referred to the fact that this project is now going far beyond the network, and is continuing to expand.

The industry representative said that the collaboration kept his company "on the cutting edge of what's happening".

> *"It keeps us totally informed. We can make our views known as to marketability and help redirect the project as necessary."*

The major drawback of this collaboration was the need to reach a consensus on the parameters of the study, definitions, and so on; in addition the time and effort that required was mentioned.

> *"It was a challenge with the need to standardize things in a relatively new field where we are all doing things slightly differently."*

> *"It slows down the process and takes time to meet and discuss and evaluate. standardizing and gathering at one site. There was a large number of people to deal with."*

The project leader didn't feel there were any drawbacks but even he added that. "There were requirements. You need mature scientists. not ego-centred investigators."

The industry representative said that they had been worried about difficulties regarding confidentiality but it hadn't, in fact, been a problem. He thought it might have been worse if the product were really revolutionary. That would require more secrecy and subsequently a smaller collaboration. But this work was in an area that was already public knowledge.

Nature of the Collaboration

All of the respondents agreed that they had functioned as a true collaborative unit. To some extent this project functions as a hub-and-spokes model of collaboration, although by no means entirely. People within the same province are in major contact almost daily with each other as well as with the project leader. There is monthly contact by phone or e-mail of almost all of the investigators with the project leader.

There is a highly significant amount of the collaboration taking place between the lab personnel (researchers, research assistants, medical practitioners, students and post-docs) across various laboratories. All information, data, results, equipment and technologies are exchanged among the entire group. There have also been many visits to other collaborators' laboratories to learn techniques.

There are formal major meetings of most or all of the principal collaborators and post-docs two to three times a year at NCE meetings and other conferences. Industrial contact is primarily through the project leader, occurring four to five times a year face-to-face, with weekly phone or e-mail contact. In addition, the industry rep has more limited contact with some of the other investigators through such means, as well as during the large meetings.

Collaboration outside the project

Some of the investigators have other collaborations in the network, both in and outside of this theme.

Other than the primary collaborations with the two companies, at least three other companies are being consulted with a view toward further involvement.

Student involvement

Three of the investigators have significant student involvement in the project. The project leader's post-doc is the "master coordinator" of all the centres involved. All three investigators were enthusiastic about the nature of the student collaboration.

Influence on Attitudes

Four of the investigators — including the industry rep — thought their attitude toward collaboration had improved.

> *"I now think the work's much more practical. It's an interesting process. fabulous to meet everyone. It's the way to go for clinical trials."*
>
> Industry: *"There's a receptiveness to industry, as opposed to typical academic aversion to applied work."*
>
> *"Progressively more positive. I was raised as a 'loner' researcher. That's a short-sighted view."*

Researchers opinions about collaborating with industry were confirmed or enhanced.

> *"The network's shown how you can work with industry. It used to be industry coming to you to run tests — then they pay for it and control it. But in the network this is our protocol — we get industry into it but we keep control.*

Interdisciplinarity

The project is totally interdisciplinary across various disciplines, as well as in terms of the personnel involved. There are medical practitioners as well as industrial technologists in the team, which is the only way to accomplish the trials.

NCE Collaboration Case Study 10

Background

This project includes three researchers at one university and one industry representative. Only one of the researchers and the industry representative were available to participate in this case study. None of the participants had worked together prior to this project.

Value Added of Collaboration

Both respondents were very enthusiastic about the collaboration commenting that it was "great", "very fruitful", and it had allowed them to do things they could not have done otherwise.

The major advantages of this collaboration are that the project has totally redirected the investigator's research and opened up a whole new area to him, while the industry representative reported that it was a collaboration of entirely different people with different perspectives covering all aspects of the problem, and added that it took an enormous force of energy to work on such project.

The industry representative said that the only drawback was the difficulty of maintaining collaborations over a long distance. The researcher commented that the drawback is "what's missing from the work is what's not there", meaning that the network is an exclusive group and there's no way of knowing what is not being included:

> *"We need to find a way to renew the networks, to find the new blood."*

Nature of the Collaboration

Both respondents said that the group had functioned as a totally collaborative unit and called it a "massive, total collaboration". There has been a total exchange of all information, results, and so on, with weekly meetings of all of the participants and daily contact by phone among most of the collaborators. The industrial representative estimated that on average the four of them are together fifteen hours a week.

Collaboration outside the project

The researcher has significant collaborations occurring across themes and networks, and there is currently some dialogue with another company in the United States.

Student involvement

The researcher is in twice-weekly contact with students and technicians from his lab and bi-monthly meetings with sub-groups of students and technicians from all three laboratories. The students and post-docs work heavily on the project. The company will be hiring students and post-docs who have worked on the project.

Influence on Attitudes

The researcher said that the network has had a very positive impact on his attitude toward collaborations. He added that it should be a very strong project on both the university and industry sides and that it isn't work that the individuals could do independently.

The researcher also felt his attitude toward collaboration with industry had changed. He feels that industry is willing to put money in to finance technological development at a period when the government is backing off.

> *"The most valuable change is that scientists now understand way more about business. Now people are dying to learn about it. It is a real cultural change."*

The industry representative reported seeing a dramatic change in the network annual meetings.

> *"At first everyone was raw and nervous and wondering how they were going to collaborate with industry. At later meetings everyone started talking about commercialization as if they'd been doing it all their lives."*

Interdisciplinarity

This project was seen as highly interdisciplinary, including virology, neuroscience and human genetics.

APPENDIX H

NCE SOCIAL AND HEALTH CASE STUDIES OVERVIEW

1.0 Introduction

This section provides an overview of the "big winner" social and health case studies. Details on individual projects are **not** provided as some results are confidential.

2.0 Methodology

This part of the evaluation was designed to investigate "big winner" projects in the areas of potential health benefits and social impacts, and to identify the role of the network in those projects. Fourteen case studies were done involving five of the renewed networks. The big winner projects were initially identified by network managers and scientific leaders, and initial data were obtained from the network on a variety of project characteristics in *"Form B or Form C: Rough estimates of benefits from network project leading to health care improvements and/or social impacts"* (hereafter called "the Forms"), which provided a structure for the networks to provide data, and also formed the basis of the initial interviews. (The case studies are written partially by using this material; see below.) All of the respondents were interviewed by telephone by the same consultant. Generally interviews ranged from 30 to 60 minutes.

Case studies were about equally divided among health improvements, social impacts and both health improvements and social impacts.

Note that many of the projects investigated in the partial benefit/cost (B/C) case studies will also have significant social and/or health impacts — these are not reported here. The case studies reported on here are those where there are significant social/health benefits, **and** the likely economic benefits are either not large or cannot be quantified even roughly at this time — but also note that some of these health/social benefits projects may also have significant economic benefits at some point in the future. The nature of such benefits will be obvious from the detailed case studies.

Wherever possible the principal investigator, the industry partner and two external experts (who were not part of the networks) were interviewed. All fourteen of the principal investigators were interviewed, one from each project.

Twelve industry representatives were interviewed, again one from each project. The only exceptions were two projects in which there was no industry partner, one project in which the industry partner declined to participate, and one project where two industry partners were interviewed (one from a private company and one from a venture capital organization).

The experts were usually selected so that one could comment on the research aspects of the project, and one could comment on the project's impacts. Twenty external experts not associated with the networks or projects were interviewed, their names provided either by the investigator or the industrial partner. Experts were asked whether they were independent enough to comment on the project; none declined. Because of confidentiality issues, two projects declined to have their projects reviewed externally; no experts were contacted in those cases. In nine cases it was not possible to distinguish the reviewers' expertise in terms of research versus application, so the experts were asked questions relevant to both topics. In three cases only one reviewer was able to participate. Reviewers were sent a copy of the completed Form for the specific project as provided by the network, as well as additional abstracts, articles and/or impact descriptions provided by the researchers and/or industrial partners. It is important to note that in most cases the reviewers based their comments only on the network descriptions and brief abstracts.

The detailed reports for individual case studies are in a separate confidential appendix. These consist of: (1) the Form information provided by the network, supplemented by material from the interviews; generally the network provided the information in the first sentence or paragraph in each category on the Form, while the interviews and other data collected in the case studies provided the additional material; and (2) detailed text comments from the interview respondents.

Please note that some of the information contained in the detailed case studies may be considered confidential by the networks and — especially — by the industrial partners.

3.0 NCE Health Improvement and Social Impacts Draft Case Studies Overview

3.1 Introduction

Exhibits H1, H2, and H3 provide an overview of the information contained in the detailed case studies. Exhibit H1 describes the specific nature of impacts that may occur, the likelihood of their occurrence, and the likely time frame over which they may happen. Some comments on this table are:

Overall benefit or competitive advantage & potential impact

- This information has been culled from interviews with researchers, industry partners, external experts, project descriptions, abstracts and articles about the work

Reported Likelihood of Impact & Reported Time to Application

- These ratings were provided by the networks on the Forms and confirmed by the researchers and industry partners during interviews.
- In one case there was a wide disparity on perceived likelihood of application. This appeared to be due to the extremely early stage of product development and a concern about falsely raising the hopes of the individuals who would benefit from this drug.

Exhibit H2 investigates the role of the network in achieving those benefits: its role in influencing and/or fostering the relevant research; its role in fostering industrial focus, contacts, and applications; its role in providing an emphasis on achieving IP protection or actually creating such protection; and what would likely have happened in the absence of the network. The responses regarding the role of the network were culled from interviews with researchers and industry.

Exhibit H3 summarizes the opinions of the external experts. (In this table, "not applicable" means no expert commented on that case study project.)

3.2 Summary of findings

From Exhibit H1 and the detailed case studies, it may be seen that all of the case studies investigated did, in fact, demonstrate significant potential (and in some cases, actual) beneficial social and/or health impacts. In a few cases, they represent the potential for true breakthroughs (e.g., neural regeneration). Most of these impacts are in the health arena, but there are also social benefits such as those related to improved education, reduced environmental damages, and so forth.

It should be noted that many other networks not included in this table will also provide significant social benefits of various kinds — these are not included either because they are less project-specific (e.g., those associated with training and development of HQP, as for Micronet) or more difficult to hypothesize (e.g., the eventual impacts of CITR's wireless communications research may be socially profound, but they are difficult to envisage in a manner concrete enough for our case study investigation).

The detailed case studies and the summary in Exhibit 2 regarding the role of the network show:

Role of network in achieving successful research results

- The role of the network was seen as very important in almost all of the case studies. By far its strongest contribution was in fostering and encouraging the collaboration, providing academic contacts, and making it possible for collaborations to take place at all.
- For clinical studies, the opportunity to do multi-centred trials was frequently attributed to the existence of the network.
- Participants in about one-third of the projects attributed the network with influencing their choice of the particular area of study their project focuses on.
- Again, participants in about one-third of the projects cited an important influence on their research as being various network meetings which gave them the chance to brainstorm about their research, discuss problems, exchange ideas and generally obtain feedback.

Role of the network in developing contacts between researchers and industry

- Over half of the project participants reported that the networks had a significant and active role overall in developing the connection between the researchers and their industrial partners.
- Most of the respondents said that the networks had taken some kind of active role in finding the appropriate industry partners and/or making the initial contacts in order to interest industry in the project.
- Almost two-thirds of the project participants said that the network had either been active in industrial discussions, negotiations and developing agreements or, where appropriate, in doing most or all of the work necessary to set up a new company to commercialize the research results.
- Several university researchers added that the network had been quite useful in keeping them focused on the commercial importance of the work and in educating them about how to function in a commercial setting, how to deal with industry, and so on.
- In several cases the network was responsible or active in the process of bringing in venture capital companies to finance and invest in the project.

Exhibit H1: Social and Health Case Studies: Nature of Impacts

Network and project	Nature of Project	Overall Benefit or Competitive Advantage	Potential Type of Impact	Reported Likelihood of Impact Occuring	Reported Years to Impact
Inspiraplex					
1. Kit for rapid lung diagnosis of viral infections	24 hour test of multiple infections	24 hours vs. 3-4 days $20-25 cost vs. $55	Facilitates rapid treatment of lung disease	High	2-3
2. Patient Education Program	Interactive CD ROM for asthma management instruction	Higher retention and efficacy of material	Improved self-management of asthma with subsequent decrease in health risks	High	2-3
3. Primary prevention of asthma in high-risk infants	Nutritional and environmental intervention program	Multi-centered multi-variate analysis of probable risk factors with long term follow-up. Analysis of viral factors.	Reduction of morbidity and mortality	Moderate	3
4. Zero complaint Air Jets	Remotely controlled and individual ventillation system for use against sick building syndrome	Auto-control of ventilation, temperature, humidity Lower cost of device and installation Ease of installation	Health improvements Worker satisfaction Reduction in absenteeism; increase in productivity	High	Now being used
NeuroScience					
5. Exogen Neuroscience Inc., Montreal	1. Test systems for cell signalling pathways 2. New molecules to address problems of neuronal cell death	1. IP protection on testing system to provide screening for pharmaceutical company 2. Fewer side effects than nerve growth factors. Ease of site delivery. Ease of modification	Safe treatment for neurodegenerative diseases including Alzheimers, stroke, acute trauma	1. High 2. Medium	1. 1-2 2. 5-7
6. Neuromotion Inc., Edmonton	1. Walkaid and Bionic Glove — external FES devices to restore functioning to paralysed limbs 2. Follow on products: Tremor Control Cuff; Limb Rigidity Analyser and others	Simplicity of use (less invasive, less cumbersome) Sophistication of technology — controllability of response	Increased quality of life and improved functioning for victims of stroke and spinal cord injury with paralysed limbs and foot drop	High	1

Network and project	Nature of Project	Overall Benefit or Competitive Advantage	Potential Type of Impact	Reported Likelihood of Impact Occuring	Reported Years to Impact
7. Neuropharm	Small molecule therapeutics 1. Calcium project — stroke treatment 2. MAG project — nerve fibre growth inhibitor 3. Neurotrophin Signalling Project	Patented molecule which may lead to regeneration of nerves	Treatment of people with neurodenerative disorders such as spinal cord injury, stroke, possibly epilepsy and Alzheimer's	Moderate - High	10
PENCE					
8. C2 Carbohydrate-based anti-adhesion therapy	Compound for topical therapeutic use against Candida infections	Lower cost than antibiotic treatment Treatment is less harsh than antibiotic Directed and well-understood mechanism Can be used preventatively	Improved treatment of people with yeast infections Used for ICU and chemotherapy patients and people with AIDS	High	2
9. E1 Enzyme degradation with laccase	Improved enzyme for biodegradation of wood pulp (grown in bacteria)	Bacterially grown enzyme easier for research and production Reduce or replace use of chlorinated bleaches Stronger pulp product	Reduction of negative environmental impact Effective in zero effluent recycling system	Moderate	5
10. E2 Cross—linked hemoglobin as a drug carrier	Cancer therapeutics	Less invasive Reduced toxicity when more site specific Only system that provides oxygen on site	More effective treatment of tumours	Moderate	10
Concrete					
11. Ministere des transports du Quebec Rehabilitation of the Jacques-Cartier bridge in Sherbrooke	Deck replacement of 200 meter long bridge with high-performance concrete	Increased strength and durability (at least double in years) Faster construction time	Decrease in cost and frequency of repairs Decrease in inconvenience and cost to users due to bridge closure	High	Now being used
12. SKW Canada Inc.	Use of waste product (silica fume) to enhance high-performance concrete (HPC)	Improved durability and strength of concrete Makes HPC easier to work with Lower cost than other additives	Elimination of waste product and waste product stockpiles, so reduced possible harmful environmental impacts Subsequent savings in disposal and transportation costs of waste product Improved HPC	High	Now being used

Network and project	Nature of Project	Overall Benefit or Competitive Advantage	Potential Type of Impact	Reported Likelihood of Impact Occuring	Reported Years to Impact
CGDN					
13. Phenylketone urea (PKU)	Development of food supplement pill to eliminate or reduce diet restrictions of people with PKU	Provide opportunity for people with PKU to eat essentially normal diet Eliminate risk to people who are unable to comply with necessity for severe restrictions Facilitates metabolic control	Improved quality of life for people with PKU Avoids neurological complications of non-compliant individuals Increased safety to newborns	High	5
14. Retinoblastoma in childhood	Cost effective genetic testing to identify at-risk individuals and facilitate treatment and prevention of eye cancer	Less invasive, less traumatic and less risky testing method then conventional management techniques Faster and less expensive than manual sequencing Prenatal testing instead of post natal	Reduced danger of anesthetic for children Reduced health care costs Reduced stress on families with Retinoblastoma Increased possibility of early treatment of tumours and subsequent prevention of eye damage	High	5

Exhibit H2: Social and Health Case Studies: Role of Network

	Role In Affecting Research						Role In Fostering Industry Contact						In Intellectual Property Protection		Without Network[3]
Network and project	Overall	Fostering Collaboration	Creating Multi-Centered Trials	Affecting Research Area Chosen	Supplying Special Equipment or Core Facility	Running Network Meetings	Overall	Providing Information and Education	Establishing Contact between Industry and Researchers	Carrying Out Negotiations	Setting up Company	Bringing in Funds	Providing Emphasis and Education	Creating Protection	
Inspiraplex															
1. Kit for rapid lung diagnosis of viral infections	High	✓	✓				E[1]		✓				✓	✓	N
2. Patient Education Program	High	✓		✓		✓	High		✓			✓	N/A[2]	N/A	N
3. Primary prevention of asthma in high-risk infants	High	✓	✓			✓	High	✓	✓				N/A	N/A	N
4. Zero complaint Air Jets	High	✓					Low		✓				N/A	N/A	S
NeuroScience															
5. Exogen Neuroscience Inc., Montreal	High	✓		✓			High	✓	✓	✓	✓	✓	✓	✓	NC, LR, LA
6. Neuromotion Inc., Edmonton	High	✓	✓				High	✓	✓		✓	✓	✓		LA, S, LR
7. Neuropharm	High	✓		✓	✓	✓	High	✓	✓			✓	✓	✓	N
PENCE															
8. C2 Carbohydrate-based anti-adhesin therapy	High	✓					High	✓	✓	✓	✓		✓	✓	S, LA, LC, N
9. E1 Enzyme degradation with laccase	Low			✓			Low						N/A	N/A	S, LR
10. E2 Cross–linked hemoglobin as a drug carrier	Medium	✓		✓			Medium		✓	✓					N

[1] E – early stages

[2] N/A – Not Applicable

[3] S – Slower
LR – Less research progress
LA – Less practical application
LC – Less collaboration
NC – No Company would have been formed
N – Not done at all
LQ – Lower quality
LL – Less likely

Network and project	Role In Affecting Research						Role In Fostering Industry Contact						In Intellectual Property Protection		Without Network[3]
	Overall	Fostering Collaboration	Creating Multi-Centered Trials	Affecting Research Area Chosen	Supplying Special Equipment or Core Facility	Running Network Meetings	Overall	Providing Information and Education	Establishing Contact between Industry and Researchers	Carrying Out Negotiations	Setting up Company	Bringing in Funds	Providing Emphasis and Education	Creating Protection	
Concrete															
11. Ministere des transports du Quebec Rehabilitation of the Jacques-Cartier bridge in Sherbrooke	High	✓				✓	High		✓	✓			N/A	N/A	N, LC, S
12. SKW Canada Inc.	High	✓					High		✓	✓			N/A	N/A	S, LC, LA
CGDN															
13. PKU	High				✓		High	✓		✓			N/A	N/A	LR, LA
14. Retinoblastoma in childhood	High	✓	✓		✓	✓	Low								LA, LC, S

[1] E – early stages

[2] N/A – Not Applicable

[3] S – Slower
LR – Less research progress
LA – Less practical application
LC – Less collaboration
NC – No Company would have been formed
N – Not done at all
LQ – Lower quality
LL – Less likely

Role of the network in intellectual property (IP) protection

- About one-third of the project respondents reported that the networks had emphasized the importance of intellectual property protection and had assisted them or actually undertaken the activities necessary to acquire the protection.
- In this category "not applicable" means either that there is no intellectual property to protect or that it was already secured prior to the network involvement

Without the Network: Researcher and industry opinions

- Half of the projects would have taken significantly longer — usually on the order of several years — without the presence of the network.
- Almost half of the respondents said that the project would simply not have been undertaken without the presence or support of the network. Respondents mostly attributed this to their inability to collaborate in the same way in order to explore all of the various aspects of the project work, or to their inability to gain access to the contacts necessary to do multicentered trials.
- Again, almost half the respondents said that their projects would not have had the same focus or degree of progress regarding commercial application without the network, or that (in one case) the spin-off company itself would not have been formed. Respondents said the network educated them and helped them focus on the application, provided the expertise, the venture capital interest, and so on that resulted in the potential application.

Exhibit H3 shows that the external reviewers, with few exceptions, agreed with the opinions of the network and industry respondents as to size and likelihood of impacts. It is important to note that the reviewers comments' were based on varying amounts of information depending on the project. This information ranged from the original (and often brief) Form provided by the networks, to half page abstracts, to published articles, to complete project proposals. In several cases the reviewers were already thoroughly familiar with the researchers' work. In some cases, the reviewers' concerns or comments about a project's experimental controls, possible design flaws, and so on were presented in terms of the reviewer's inability to know, based on the information provided, if those issues were being handled properly.

Other comments on Exhibit H3 are:

Quality and relevance of research

- Reviewers were split more or less 50/50 on whether the research was very good to excellent, or simply good solid research, with only one exception which related to dissatisfaction with the perceived chances of success of a newly-formed company (and this formed only part of the project under review).
- Not shown in the Exhibit was that 13 of the 20 reviewers spontaneously commented that the NCE research and/or the researchers were the leading ones in the international field represented in that project, or that the NCE project was "unique", or the only one that had been successful to date. These comments covered 11 of the 14 projects, remembering that two of the projects had no external reviewers. The remaining project was not poorly-rated, just not rated as highly.

Exhibit H3: Social and Health Case Studies: Opinions of External Reviewers

	Quality and Relevance of Research		Likelihood and Impact of Application		Importance of Impact		Without Network[1]	
Network and project	Expert #1	Expert #2	Expert #1	Expert #2	Expert #1	Expert #2	Expert #1	Expert #2
Inspiraplex								
1. Kit for rapid lung diagnosis of viral infections	Good		Moderate		High		MT, LQ	
2. Patient Education Program	Good	Good	Very Good	High	Very High	Very High	LC, LQ	N. LC
3. Primary prevention of asthma in high-risk infants	Very Good	Good	Very High	Moderate	Very High	High	N, LC	N
4. Zero complaint Air Jets	Good	Good	Very High	High	High	High	N	N, LC
NeuroScience								
5. Exogen Neuroscience Inc., Montreal								
(1) Test Systems	Very Good	Very Good	Low - Moderate	Low		Low	LL	N
(2) New Molecules	Very Good	Very Good	High	Very High	Very High	Very High	?	S
6. Neuromotion Inc., Edmonton	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
7. Neuropharm	Good	Very Good	Very High	Very High	Very High	Very High	LC	LC
PENCE								
8. C2 Carbohydrate-based anti-adhesion therapy	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
9. E1 Enzyme degradation with laccase	Very Good		Very High		Very High		N, LC	
10. E2 Cross—linked hemoglobin as a drug carrier	Very Good	Good	High	Very High	Very High	High	S, LC	LC
Concrete								
11. Ministere des transports du Quebec Rehabilitation of the Jacques-Cartier bridge in Sherbrooke	Very Good	Very Good	Very High	Very High	Very High	Very High	N, LC	S, LC
12. SKW Canada Inc.	Good	Very Good	Very High	Very High	High	High	S, LC, LA	S, LC, LA
CGDN								
13. Phenylketone urea (PKU)	Very Good		Very High		Very High		N, LC, S	
14. Retinoblastoma in childhood	Good		Very High		High		NC	

[1] S – Slower

LR – Less research progress

LA – Less practical application

LC – Less collaboration

NC – No Company would have been formed

N – Not done at all

LQ – Lower quality

LL – Less likely

Likelihood and impact of the potential application

- The reviewers' opinions were sometimes limited by the simple fact that the necessary research has not as yet been completed; thus it is impossible to form an appropriate opinion as to the efficacy or magnitude of the product. Opinions also included concerns about various obstacles that would be faced and the need to overcome them, which would also affect what reviewers otherwise deemed to be large impacts. The responses in this table are based, to some extent, on reviewers general opinion about the work given their own evaluated "best case scenario".
- Over half of the reviewers rated the likelihood and impact of the application as very high. A few were rated as high, two as medium and only the project in which the project's near-term company was considered to be unlikely to succeed (see above) and was rated as low or low to moderate; even there, the other parts of the project (which involved more basic research and thus application in a longer time frame) were highly rated.

Importance of the impact

- Over half of the reviewers rated the projects as dealing with very important areas of research and application, with most of the remainder rating the projects as important.

Without the network

- The most frequently cited impact of the absence of the network was a lower degree of resulting collaboration — this was usually seen as quite a critical lack. Almost half of the reviewers felt the projects would not have been done at all without the network and several reviewers felt that the work would have gone significantly slower.

APPENDIX I

INTERVIEWS WITH NCE NON-PARTICIPANTS

Appendix I – Interviews with NCE Non-Participants

Methodology

Networks (through the network managers and Board Chairs) were asked for suggestions as to organizations that should have been involved with their networks, but were not. Only one renewed network suggested such organizations, while three of the new networks did so. Twenty respondents were selected randomly from these suggestions, distributed as evenly as possible across the networks.

Summary of Findings

Awareness and Overall Impressions

- Over half of the non-participants had had some involvement with the NCE. Several companies had explored becoming partners, been part of a network proposal or in fact consulted in the initial establishment of the network. Several others supported network activities to a small degree with cash or in kind contributions, or had low-level collaborations with network researchers.
- In general the respondents were familiar with the network and its goals and only somewhat less aware of the NCE program as a whole.
- About a third of the non-participants had positive attitudes towards the network and the NCE program, citing both the program objectives and the quality of specific projects, products, or areas of study. Another third were more negative about specific networks, primarily because of the perceived overly-theoretical focus of the research and the consequent lack of focus on industry involvement. About half of the respondents had no opinion about the NCE program as a whole.

Possible Future Involvement

- Only about a quarter of the respondents had been invited by the networks to become more involved. Cost was mentioned by a few of these non-participants as the major drawback of participating, along with differing time frames of industry and academe, the overly-theoretical emphasis, and concerns over confidentiality. The advantages of possible involvement for these respondents were the exposure to new information, expertise, and facilities, with the potential to lead to commercializable products and increased collaborative support and credibility.
- Well over half of the respondents said they were not invited to become more involved in the networks. (We should note that the new networks commented that they simply hadn't had time to contact these individuals.) Their perception of the advantages and disadvantages of becoming involved were the same as the previous group. A couple of these respondents were also concerned about the long-term stability of the funding and the research.

- A few respondents said they had wanted to be involved but had been ignored by the network, in one case even though they had been promised involvement.
- Several of the respondents reported that if there were a more applied focus to the work, and more effort made to include and inform industry about the projects, they would be more likely to participate in a network project. A few non-participants said they would required financial support to do so (note that program rules don't allow this).
- Over half of the non-participants felt that the NCE filled a useful niche in the spectrum of research support programs, while about a third felt that it duplicated existing programs or existing R&D in industry.
- While most respondents had no opinions concerning the management of the specific network under question, a few commented that it appeared to be very professionally run.
- A few respondents thought the network had the potential for good market opportunities for their organization, while some others felt that network focus and time frame made likely impacts very limited.

APPENDIX J

PARTIAL BENEFIT/COST METHODOLOGY

Appendix J: Partial Benefit/Cost Methodology

J.1 Introduction

The present value (PV) of potential economic benefits for projects included in this analysis totalled $612 million (Cdn 1996$). The PV of the program costs for Phase I and II, adjusted for inflation, were $578 million (Cdn 1996$). The net present value (NPV), or benefits minus costs, is therefore about $34 million. This suggests that the NCE program is likely to provide economic benefits **at least** equal to the costs incurred in program delivery. Given that many network results have yet to be commercialized, and that many non-quantifiable benefits are expected, this is a very positive result — but see the discussion in Section J.5. This appendix outlines the process undertaken in estimating these benefits and costs.

The partial benefit cost case studies of the NCE program was designed to determine, on the basis of available information, whether the economic benefits that may accrue from NCE supported research projects cover the program costs for Phase I and Phase II of the program.

Benefit cost analysis measures the contribution of the project or the program to economic welfare. With complete information, it is possible to calculate a benefit cost ratio for each project and for the program overall. The NCE program presents obstacles to this process for a number of reasons:

- most of the economic benefits that may be realized from NCE supported research have not yet been realized. Commercialization of many technologies are just beginning and as such obtaining *actual* economic benefits is impossible;
- the treatment of in-kind contributions to research projects is problematic and many researchers were unable to provide detailed information on the level of contributions;
- many economic benefits which may accrue are very difficult to quantify. Given the scope of this study it was inappropriate to attempt to quantify these variables. A complete benefit cost analysis would require quantification of all possible benefits.

To overcome these obstacles we have used what is commonly referred to as a partial benefit cost (B/C) analysis[1] to evaluate the economic benefits that may result from NCE related research. This only reviews benefits associated with a sample of "big winner" projects, but compares those to all known program and partner costs. It does not provide a basis on which to compare individual projects or programs.

Partial benefit cost analysis is based on the same principles as benefit cost analysis. That is, the benefits and costs of the NCE program are measured in terms of gains or loses to society. It is possible to proceed in the absence of quantitative variables for all economic benefits and project specific research costs. However, the absence of project specific research costs does not allow for project-specific evaluation. The economic benefits of all projects can be aggregated and compared to total NCE program costs to assess the economic impact of the program overall.

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[1] Detail of standard benefit cost analysis may be found in E.J. Michan, *Elements of Cost-Benefit Analysis*, George Allen and Unwin Limited, 1972. This was modified for use in R&D programs by The DPA Group (now The ARA Consulting Group) in: The DPA Group, *Evaluation of the Cost/effectiveness of NSERC's Strategic Grants Program*, January 1988.

To evaluate the NCE program it was necessary to:

- determine a sample of NCE supported projects which could potentially yield high economic benefits ("big winners");
- examine the nature and potential magnitude of the economic benefits. Ideally, quantitative estimates are required;
- investigate the accuracy and availability of quantitative information for the potential economic benefits; and,
- determine the degree to which the aforementioned economic benefits are directly attributable to NCE supported research.

The methodology used in the evaluation addressed each of these information requirements. A detailed outline of the approach and methodology utilized in the evaluation is presented below.

J.2 Approach

This section outlines our approach to the estimation of economic benefits that may accrue from NCE-related research. This approach includes the methodology used to select the projects for detailed analysis. The methodology used to complete the actual estimation is contained in the next section.

Project Selection

The networks were initially asked to provide project summary forms for those projects which had or were expected to provide significant economic benefits. Such forms were received from 8 renewed networks with information on 41 projects. These 41 projects were compared to produce a subset of projects based on the following criteria:

- a well-defined application of the research results and the identification of the user groups;
- an identifiable market and market size;
- an identifiable link between the NCE-supported research and the potential economic benefits described;
- the ability to estimate economic benefits in dollar terms (for cost reductions in processes, revenue generation, royalty and licence fee income) using direct market prices; and,
- the identification of the time pattern describing the application and market penetration of the technology commercialization process.

The application of these criteria to the 41 projects resulted in a subset of 23 projects for which more detailed information was collected. A detailed interview guide was utilized in discussions with the researchers and the partner companies to assess the ability to produce quantitative estimates of the economic benefits that may accrue from these projects. This process resulted in 8 projects which were initially included in the quantitative analysis. Follow-up on the partner survey of respondents indicating they expected large economic returns from network research resulted in one additional project being included in the quantitative analysis, for a total of 9 projects.

Other projects were excluded from quantitative analysis for a number of reasons. Primarily exclusion was due to the lack of information on the market size, timing of benefits, revenue generation or cost savings that may accrue from the application of the research. The inability to assess the incrementality-or low indicated incrementality-of the research to NCE program support was also a reason for excluding projects. An additional four projects were deleted from the analysis completely due to obstacles in primary data collection.

Summary of Projects

Confidentiality issues do not allow descriptions of those projects included in the quantitative analysis. As such, a summary is provided in generic terms only. Exhibit J.1 shows the process described above. The quantitative estimates outlined in this analysis include only those 9 projects for which detailed and defensible quantitative information was available.

J.3 Methodology

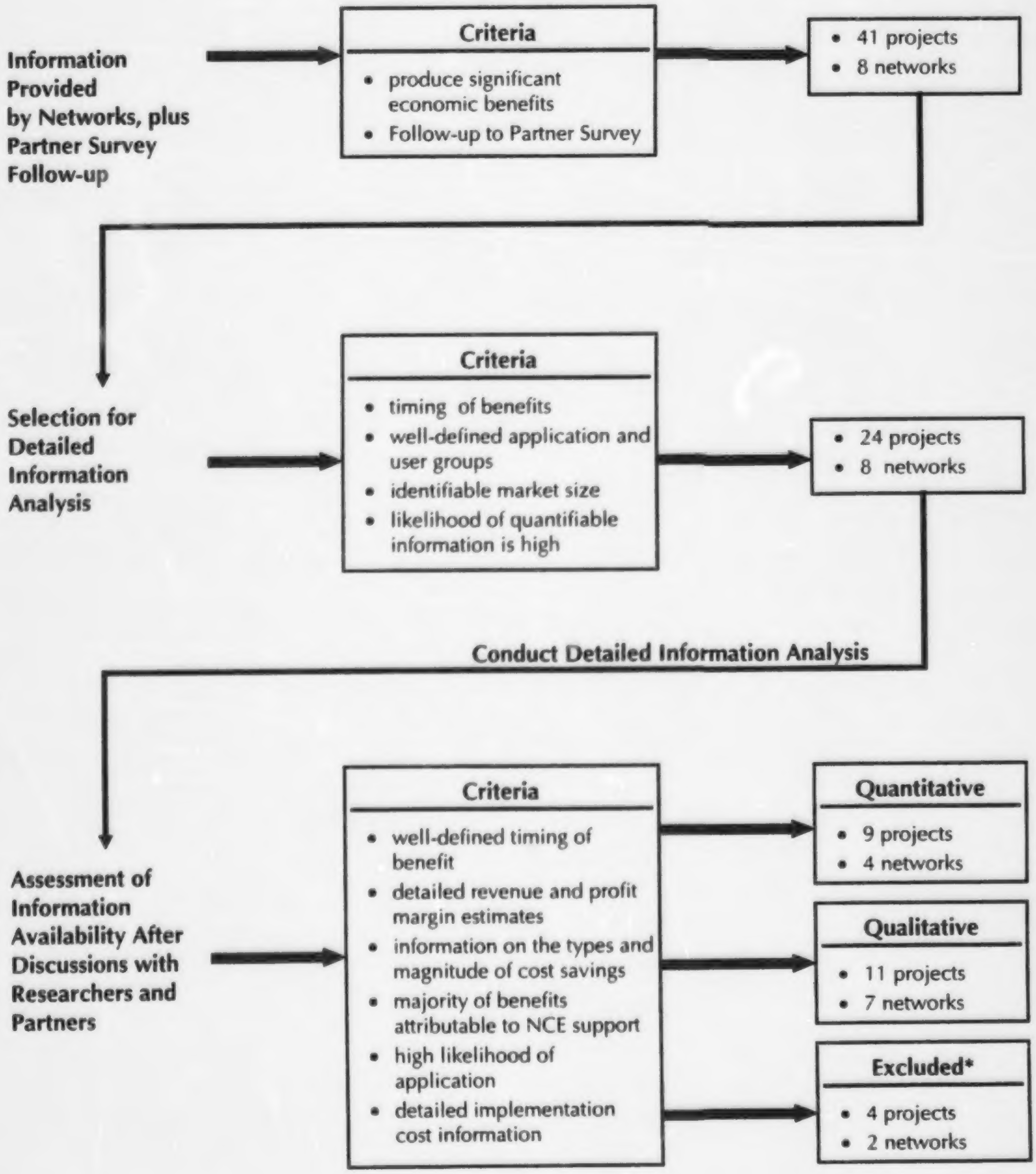
The evaluation compares the costs and benefits of a project or program from the perspective of society as a whole. The referent group used in the analysis is Canada as NCE is a national program, financed by tax revenues from across Canada. This concept is important in assessing the role of scientific research as it necessarily excludes those benefits which may be realized by non-members of the referent group (e.g., non-Canadian companies).

It should be noted that each case study has very specific assumptions. The methodology outlined below is generic and, although it is applicable each project, it does not represent an exhaustive list of the project-specific assumptions.

Information Sources

There were numerous sources of information for the evaluation. As stated earlier, the networks submitted initial information on projects which could provide significant economic benefits. This information was subsequently used in interviews with the researchers, network representatives, promoters and marketers, and partner companies. These interviews provided a majority of the information used in the quantitative analysis. Detailed market and economic assessments were available for some projects. Copies of these reports were requested and used in the analysis where possible.

Exhibit J.1: Project Selection and Summary


Information Provided by Networks, plus Partner Survey Follow-up
Criteria
• produce significant economic benefits
• Follow-up to Partner Survey
• 41 projects
• 8 networks
Selection for Detailed Information Analysis
Criteria
• timing of benefits
• well-defined application and user groups
• identifiable market size
• likelihood of quantifiable information is high
• 24 projects
• 8 networks
Conduct Detailed Information Analysis
Assessment of Information Availability After Discussions with Researchers and Partners
Criteria
• well-defined timing of benefit
• detailed revenue and profit margin estimates
• information on the types and magnitude of cost savings
• majority of benefits attributable to NCE support
• high likelihood of application
• detailed implementation cost information
Quantitative
• 9 projects
• 4 networks
Qualitative
• 11 projects
• 7 networks
Excluded*
• 4 projects
• 2 networks

* Projects were excluded primarily due to our inability to contact those persons involved in research and commercialization

Economic Benefits

Quantification of economic benefits is often very difficult. This is especially true for research and development projects as the variables that must be estimated are often unknown and may depend on many extraneous economic factors. The individuality of each project and its corresponding potential economic benefits makes estimation for each project a unique process.

Some economic benefits (i.e. quality of life and environmental protection) are more difficult to estimate and quantify. For the most part the analysis focuses on those benefits that are more often considered easily quantifiable (e.g. product sales revenues). The estimates of benefits could therefore be considered conservative. Additionally, we used lower estimates where ranges were given for variables such as market size, penetration, sales revenues, cost savings, etc. This also serves to provide a conservative estimate of economic benefits.

All of the nine projects in the quantitative analysis contain "forecasted" benefits. The time required for commercialization of products is very long and only one project examined had already realized sales revenues. It should therefore be cautioned that the economic benefits presented in this report are "forecasted" and represent potential benefits only. However, all parties interviewed believed that there is an extremely high probability that the benefits will be realized.

Increased Sales

Increased sales represent benefits that accrue to the manufacturer or distributor of products and processes resulting from research results. They may flow from higher sales of an improved product or sales from a new product. These are very often easier to estimate than end user benefits but sales only represent a partial measure of total benefits to society; thus they are a conservative estimate of benefits. (For example, sales revenues of a product are relatively easy to measure, but extra sales revenues resulting form the use of that better product are usually not quantifiable.).

To attribute increased sales to NCE research it is necessary to consider only sales that are generated due to the research results. For new products, total sales is an appropriate proxy. For increased sales, only those sales that are due to the product improvements flowing from research are pertinent. Only increased sales garnered by Canadian companies are included in the analysis (although royalties paid by non-Canadian companies to Canadian entities are included).

It is also necessary to estimate the cost of production (capital, labour, and materials) to provide a net sales figure for the analysis. We have tried to be conservative in estimating the net sales (or conversely, liberal in estimating the cost of production). Often, estimates are available for what would be considered the cost of goods sold. These estimates do not include overhead expenses, research and development expenses, etc. that the company incurs in its operations but does not allocate to its specific products. The profit margin on the actual product therefore overestimates the profit margin of the company overall. We have discussed the profit margins with the researchers or promoters of the commercial applications to collect information that provides a "realistic" profit margin for the products in the evaluation.

Cost Savings

Cost savings applicable to the research carried out in some relevant NCE projects were also estimated. Once the cost savings have been estimated it is necessary to estimate the market in which these cost savings will apply. Cost savings are most often estimated as:

- a dollar savings per unit produced; or
- a percentage in the reduction of current costs.

The definition of the market is extremely important in estimating total cost savings. This requires a clear understanding of the end users (including their location, industry or part of industry, and markets). The sources of information for the potential market included the researcher, partners, or people involved in the marketing or promotion of research results.

The time profile of market growth is also necessary to estimate cost savings. The information required for the profile is the year in which maximum market size is reached, the pattern of market growth, and the estimated life of the product or service.

Royalties

Royalties represent the benefits received by the research and/or their institution. The method of payment for royalties depends on the contractual arrangement. The method of payment will dictate additional information that must be included in the benefit-cost analyses.

Royalty payments between Canadian entities are merely transfer payments and are excluded from the calculation of gross benefits. Royalty payments from non-Canadian entities to Canadian institutions, researchers, or companies represent an economic benefit to Canada and have been included in the analysis

Economic Costs

Costs of Research

The costs of research for NCE projects includes:

- the value of NCE funds applied to that project;
- the value of any other Canadian research grants contributing directly to the NCE project research results; and
- any administrative costs of the NCE network agencies.

Detailed project specific cost information was not available. Additionally, the treatment and accuracy of in-kind contributions made the collection of research costs difficult. The absence of this information precludes the evaluation of individual project cost effectiveness. The economic benefits (net of implementation costs) were therefore compared to overall program costs only. These program costs were obtained from NCE directly. For this analysis, we have included research costs from 1988-1989 through 1995-1996. Only cash contributions have been included in the research costs (e.g. in-kind contributions have not been included in the total program costs).

Implementation Costs

These costs include all costs incurred from the time the results leave the researcher until the benefits are reaped by the end user. The include such items as the cost of acquiring the research results, further R&D, marketing and promotion, and set up costs. They may also include the costs to the end user to implement the research product or service. Implementation costs were collected during the interview process. Implementation costs were often dependent on a number of future outcomes which could influence their magnitude. We used upper estimates for all implementation costs.

Incrementality

Incrementality identifies the degree to which benefits and costs are attributable to the NCE projects and the program overall. The key piece of information required in estimating incrementality is the degree to which the research results would have been available in the absence of NCE funding. This also requires knowledge of parallel research being conducted elsewhere.

When considering parallel research it is necessary to know its location. If parallel research is being conducted within the referent group (in this case Canada), the benefits can not be considered incremental as the same set of benefits would accrue to Canadians in the absence of the NCE program.

Parallel research conducted outside of Canada is more problematic. For example, benefits can still accrue to Canadian end users even if the results were generated outside of the country. These benefits would therefore not be incremental to the NCE program. However, economic benefits associated with the sale of new products or increased sale of improved products would be considered incremental because sales revenues (and in particular, export revenues) would have accrued to non-Canadians in the absence of the program.

Incrementality is also greatly affected by the timing of research results. Very often, in the absence of research, the results would occur but at a later time. Due to discounting, these future benefits would therefore have a lower net present value. The incremental benefits of the NCE program (with no parallel research) would thus be represented by the difference in the two present value calculation from the two profiles.

A series of detailed questions were included in the interview guide to provide information on program incrementality. Generally, the incrementality of the economic benefits to NCE was very high.

Discounting

Costs and benefits for scientific research often occur at very different points in time. Discounting is used to calculate "present value equivalents" which are comparable. The present value equivalent is the dollar value which, if invested at a given interest rate today, would just equal that benefit or cost in the year in which it occurs. This analysis used a discount rate of 8% for all NPV calculations.

J.4 Project Data

Interviews with researchers, promoters, and partners provided the information necessary to evaluate the cost effectiveness of the NCE program. Information availability was the main criteria in deciding if quantitative estimation was possible. This section provides information on the costs and benefits included in the analysis. The following summarizes these findings into overall program cost effectiveness.

Economic Costs

The economic costs in the analysis included the implementation costs for each of the nine quantifiable projects and the NCE program costs (for the program overall). The absence of detailed research costs for each project made individual project cost effectiveness inappropriate.

The project specific implementation costs varied considerably among the project examined. They include items such as further research and development, marketing and promotion costs, and installation costs.

The program costs were provided by NCE and subsequently adjusted to the 1996 base year. They include Phase I and Phase II grants and administration expenditures from 1988 -1995. They do not include in-kind contributions. Exhibit J.2 summarizes these costs.

Exhibit J.2 NCE Program Costs (Cdn 1996$)

Program Year	Grants/Administration Expenditures	Other Sources of Income	Total
1988-1989	$1 475 761	0	$1 475 761
1989-1990	$3 594 893	0	$3 594 893
1990-1991	$71 836 346	$5 321 967	$77 158 312
1991-1992	$59 399 329	$18 078 144	$77 477 474
1992-1993	$57 902 476	$26 189 708	$84 092 184
1993-1994	$52 950 464	$534 836	$53 485 300
1994-1995	$57 267 856	$11 570 947	$68 838 803
1995-1996	$47 095 892	$18 723 501	$65 819 392
Total	**$351 523 017**	**$80 419 103**	**$431 942 119**

Economic Benefits

Quantitative economic benefits were calculated for nine NCE projects. These benefits are summarized in Exhibit J.3. This table shows the categories of benefits that have been included for each of the projects. Most benefits have been quantified and included in the analysis except "other benefits" which have only been included qualitatively. Some cost savings were difficult to estimate and have also been excluded from the analysis. The exclusion of "other benefits" and some cost savings provides what could be considered a conservative estimate of the total benefits that may accrue from these nine projects.

Exhibit J.3 Economic Benefits

Project	Past/Current Product Sales	Future Project Sales	Cost Savings	Other Benefits	Job Creation
Project A		✓	✓*		
Project B		✓	✓*		✓
Project C	✓	✓	✓*		✓
Project D		✓	✓	✓	
Project E		✓	✓	✓	✓
Project F		✓	✓*	✓	
Project G		✓	✓*	✓	
Project H		✓	✓*	✓	
Project I		✓	✓*	✓	

* Interviews indicated that these projects may provide significant end user cost savings. Information to provide quantitative estimates were not available and they have therefore been excluded from the quantitative analysis. If included, they could greatly increase the economic benefits of the projects examined.

J.5 Partial Benefit Cost Analysis Findings

Overall

The analysis uses the aggregated estimates of gross benefits and implementation costs from the individual project case studies. In evaluating the program, these "net project benefits" are compared to the total costs of NCE supported research for the whole program.

The NPV of NCE supported research costs is estimated at approximately $611.9 million (1996$). The net economic benefit of the NCE program is indicated by the difference between the benefits of the nine quantifiable case studies (net of implementation and production costs) and the costs of NCE supported research. Aggregate estimates are:

	Present Value (1996 $, millions)
Case Study Benefits (net of implementation and production costs)	$611.9
Total Program Research Costs	$578.3
Net Present Value (NPV)	**$ 33.6**

Based on the nine case studies examined, we can conclude that the NCE program is likely to at least recover its costs. However, it must be remembered that the economic benefits for each of the case studies represents forecasted benefits only. Unforeseen barriers during commercialization could result in some projects not reaching their intended market and these economic benefits remaining unrealized. At this point, it is impossible to state the magnitude of the economic benefit that will actually be realized from any or all of these nine projects.

Sensitivity to Assumptions

Overall, the analysis is very sensitive to factors that can either greatly increase, or greatly decrease, the NPV.

On the pessimistic side is the very uneven distribution of the aggregated benefit estimate among the projects examined. For example, the benefits of the individual case study projects ranged from $2.5 million to $255.3 million. Three of the projects account for 86% of the aggregated benefit estimate. This distribution shows that the cost effectiveness evaluation would be altered considerably if just one of the examined projects experiences difficulties during the commercialization process.

On the optimistic side, all effort has been taken to provide a conservative estimate of potential economic benefits. Using upper estimates of revenues, cost savings, market sizes, etc. would have provided a larger estimate of benefits.

In addition, this analysis has considered only nine of the many NCE projects supported, at least in part, by NCE funding, and even for these nine the end user benefits and/or cost savings, are, for the most part, not included. The other network projects are all at varying stages of development and commercialization but many of those not considered in the analysis will undoubtedly provide some economic benefit in the future. Additionally, it would appear that many of the projects considered qualitatively in this analysis will also result in potentially significant economic benefits. Even those that don't, provide significant social benefits. The estimates provided above should be viewed in light of this larger collection of NCE projects that may provide future economic and/or social benefits.

APPENDIX K

NETWORK ANNUAL REPORTS "APPENDIX TABLE" DATA — PHASE I

(ONLY FOR NETWORKS THAT WERE RENEWED IN PHASE II)

Appendix K: "Appendix Table" Data – Phase I (only for networks that were renewed in Phase II)

The tables following are summaries of a portion of the material provided by each network to the NCE Directorate in "appendix tables" to their Annual Reports. The data relevant to this evaluation have been summarized per network, and for all networks combined. Note that there are some missing data, since some networks did not provide the appendix table material in some years.

The data presented here were prepared from database files provided to ARA by the NCE. Each year the NCE program officers attempt to verify each network's data and ensure that they are comparable from network to network (e.g., that in-kind contributions are valued in comparable ways). Although some problems remain, these data are good indicators of network performance.

Table K.1.1: Participating Organizations - Phase I (Signatories and Non- Signatories Combined)

Type of Organization		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
Universities*	1990	7	0	14	7	18	6	10	16	0	3	81
Firms	1990	5	0	0	2	26	6	1	13	0	5	58
Federal departments/agencies	1990	2	0	0	0	1	1	1	1	0	2	8
Provincial departments/agencies	1990	0	0	0	0	3	2	0	3	0	0	8
Others	1990	0	0	2	0	3	9	0	4	0	1	19
Universities*	1991	7	0	14	7	18	7	10	16	0	3	82
Firms	1991	5	0	0	2	28	4	1	14	0	5	59
Federal departments/agencies	1991	2	0	0	0	3	2	1	1	0	2	11
Provincial departments/agencies	1991	0	0	0	0	4	1	0	3	0	0	8
Others	1991	0	0	3	0	3	11	0	4	0	1	22
Universities*	1992	0	0	14	7	19	10	10	16	37	3	116
Firms	1992	2	0	0	2	27	5	1	11	33	6	87
Federal departments/agencies	1992	2	0	0	0	5	4	1	1	0	2	15
Provincial departments/agencies	1992	0	0	0	0	4	6	0	3	0	0	13
Others	1992	0	0	0	0	4	20	0	4	0	1	29

Table K.1.1: Participating Organizations - Phase I Totals (Signatories and Non- Signatories Combined)

	Year		
Type of Organization	1990	1991	1992
Universities*	81	82	116
Firms	58	59	87
Federal departments/agencies	8	11	15
Provincial departments/agencies	8	8	13
Others	19	22	29

* Note that the total for universities represents the number of individual network-university agreements. Since most universities have signed Internal Agreements with more than one network, the total number of individual universities involved is substantially lower than shown.

Table K.2.1: Cash Support - Phase I

Sources From		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
NCE	1990	4,463,000	0	2,632,000	2,269,729	6,905,000	3,717,803	4,548,000	2,700,000			27,237,522
University	1990	54,500	0	2,800	271,913	0	0	0	0			331,203
Federal government/agency	1990	45,200	0	0	0	43,500	0	0	0			90,690
Provincial government/agency	1990	982,726	0	241,500	154,000	15,000	0	0	0			1,395,216
Industry	1990	0	0	0	271,913	109,500	0	20,000	0			403,403
Other Sources	1990	22,500	0	0	0	0	0	0	0			24,490
NCE	1991	4,641,000	3,800,000	3,493,000	1,258,650	5,945,000	3,143,480	3,320,900	2,700,000		4,232,864	32,536,885
Industry	1991	214,000	70,000	0	232,600	109,500	0	25,000	1,409,590		0	2,062,681
Federal government/agency	1991	323,328	0	0	783,000	44,500	0	0	0		0	1,152,819
Provincial government/agency	1991	1,379,199	500,000	421,177	1,147,000	5,000	327,200	0	2,463,324		770,212	7,015,103
University	1991	1,165,200	0	2,800	232,600	0	0	0	407,475		0	1,810,066
Other Sources	1991	45,000	0	0	0	0	0	0	0		0	46,991
NCE	1992	4,765,218	4,200,000	3,781,250	1,284,205	5,671,250	2,778,803	3,247,300	2,700,000	2,853,438	6,021,725	37,305,181
University	1992	40,500	0	0	106,705	0	0	0	420,718	0	0	569,915
Federal government/agency	1992	841,680	0	102,500	860,550	44,000	1,110,605	0	177,255	2,283,425	0	5,422,007
Provincial government/agency	1992	1,555,397	638,000	318,537	1,119,356	9,900	432,630	0	1,708,965	453,235	971,416	7,209,428
Industry	1992	343,388	195,000	25,000	422,800	107,000	739,750	30,000	1,073,943	409,250	0	3,348,123
Other Sources	1992	104,795	0	49,679	0	0	94,000	0	0	80,000	1,030,978	1,361,444

Table K.2.1: Cash Support - Phase I Totals

	Year		
Sources of Funds	1990	1991	1992
NCE	27,237,522	32,536,885	37,305,181
University	331,203	2,062,681	569,915
Federal government/agency	90,690	1,152,819	5,422,007
Provincial government/agency	1,395,216	7,015,103	7,209,428
Industry	403,403	1,810,066	3,348,123
Other Sources	24,490	46,991	1,361,444

Note that these data are incomplete –
data from several networks are missing.

Table K.2.2: In-Kind Support - Phase I

Sources From		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
NCE	1990	0	0	0	0	0	25,000	0	0			25,000
Industry	1990	366,918	0	75,000	0	0	530,000	2,500,000	0			3,471,918
Federal government/agency	1990	0	0	0	0	0	0	0	0			0
Provincial government/agency	1990	0	0	0	0	0	0	0	0			0
University	1990	340,000	0	612,000	0	0	1,477,514	1,600,000	0			4,029,514
Other Sources	1990	0	0	0	0	0	0	0	0			0
NCE	1991	0	0	0	0	0	25,000	0	0		0	25,000
Industry	1991	665,446	3,000	355,000	30,000	3,000	535,000	2,700,000	415,600		248,000	4,955,046
Federal government/agency	1991	0	0	0	0	0	20,000	0	20,000		1,200,000	1,240,000
Provincial government/agency	1991	0	10,000	0	0	10,000	27,500	0	5,000		0	52,500
University	1991	340,000	10,000	640,000	30,000	10,000	2,068,448	1,600,000	55,000		0	4,753,448
Other Sources	1991	0	2,500	0	0	2,500	0	0	20,000		0	25,000
NCE	1992	0	0	0	0	0	25,000	0	0	50,000	0	75,000
Industry	1992	480,647	40,000	480,000	130,442	40,000	1,684,200	2,620,000	1,077,300	65,000	1,637,000	8,254,589
Federal government/agency	1992	0	0	0	0	0	20,000	0	37,000	0	2,000,000	2,057,000
Provincial government/agency	1992	0	0	0	0	0	6,000	0	50,000	156,000	0	212,000
University	1992	340,000	30,000	309,200	0	30,000	2,127,347	1,600,000	1,353,262	0	0	5,789,809
Other Sources	1992	0	10,000	0	0	10,000	0	0	5,000	0	0	25,000

Table K.2.2: In-Kind Support - Phase I Totals

	Year		
Sources of Funds	1990	1991	1992
NCE	25,000	25,000	75,000
University	3,471,918	4,955,046	8,254,589
Federal government/agency	0	1,240,000	2,057,000
Provincial government/agency	0	52,500	212,000
Industry	4,029,514	4,753,448	5,789,809
Other Sources	0	25,000	25,000

Incomplete data.

Table K.5.1: Network Personnel Supported by NCE Funds - Phase I*

Network Research Personnel		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
Faculty Members	1990	0		1	0	0	4	0	12			17
Professional Staff	1990	0		8	0	61	3	13	0			85
Research Associates	1990	0		1	9.5	6	4	2	0			22.5
Post doctoral Fellows	1990	0		5	2	28	18	14	0			67
Technical Staff	1990	0		9	5	23	28	6	0			71
Graduate Students	1990	0		54	17.5	217	3	34	0			325.5
Summer Students	1990	0		0	1	5	0	21	0			27
Other	1990	0		0	0	0	3	2	0			5
Faculty Members	1991	0		1	0	0	4	0	0	12	2	19
Professional Staff	1991	0		26	11	47	3	22	0	4	0	113
Research Associates	1991	13		0	2	3	4	2	13.5	7	3	47.5
Post doctoral Fellows	1991	35		24	4	33	27	19	4.8	23	6	175.8
Technical Staff	1991	37		14	13	21	51	2	0	37	31	206
Graduate Students	1991	33		125	27	181	14	41	79.9	28	9	537.9
Summer Students	1991	13		7	8	3	0	23	10.1	12	0	76.1
Other	1991	0		7	9	2	5	2	0	6	0	31
Faculty Members	1992	0		1	0	0	4	0	0		1	6
Professional Staff	1992	5		37	8	59	6	15	0		5	135
Research Associates	1992	16		0	5	1	11	2	18.7		4	57.7
Post doctoral Fellows	1992	24		15	7	27	38	20	8.9		46	185.9
Technical Staff	1992	43		16	9	31	39	4	0		19	161
Graduate Students	1992	45		142	27	199	14	51	81.2		11	570.2
Summer Students	1992	15		14	11	3	6	28	8.6		3	88.6
Other	1992	10		2	4	2	7	2	0		7	34

Table K.5.1: Network Personnel Supported by NCE Funds - Phase I Totals*

Network Research Personnel	Year		
	1990	1991	1992
Faculty Members	17	19	6
Professional Staff	85	113	135
Research Associates	23	48	58
Post doctoral Fellows	67	176	186
Technical Staff	71	206	161
Graduate Students	326	538	570
Summer Students	27	76.1	88.6
Other	5	31	34

* PY Equivalents

Table K.5.2: Network Personnel Supported by Other Funding - Phase I*

Network Research Personnel		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
Faculty Members	1990	0		32	11	130	51	31	0			255
Professional Staff	1990	0		5	0	0	3	9	0			17
Research Associates	1990	0		26	0	0	3	4	0			33
Post doctoral Fellows	1990	0		11	0	0	21	5	0			37
Technical Staff	1990	0		1	0	13	4	2	0			20
Graduate Students	1990	0		40	0	0	12	15	0			67
Summer Students	1990	0		0	0	0	0	4	0			4
Other	1990	0		15	0	128	0	0	0			143
Faculty Members	1991	0		66	11	130	56	27	0	89	36	415
Professional Staff	1991	0		7	8	10	0	13	0	3	26	67
Research Associates	1991	0		0	1	0	5	4	16.5	8	20	54.5
Post doctoral Fellows	1991	0		0	1	7	35	6	9.2	22	20	100.2
Technical Staff	1991	0		1	17	8	3	2	0	41	17	89
Graduate Students	1991	0		32	26	125	23	20	122.1	51	16	415.1
Summer Students	1991	0		0	6	0	2	4	10.9	10	0	32.9
Other	1991	0		0	5	128	0	0	0	20	4	157
Faculty Members	1,992	39		64	11	135	59	34	0		47	389
Professional Staff	1992	14		18	17	7	8	14	0		14	92
Research Associates	1992	6		0	1	0	16	2	28.3		18	71.3
Post doctoral Fellows	1992	16		0	1	15	37	6	8.1		27	110.1
Technical Staff	1992	7		3	19	14	23	10	0		32	108
Graduate Students	1992	17		72	39	170	31	17	148.8		20	514.8
Summer Students	1992	6		2	16	0	0	6	6.4		6	42.4
Other	1992	2		3	1	0	3	0	0		0	9

Table K.5.2: Network Personnel Supported by Other Funding - Phase I Totals*

Network Research Personnel	Year		
	1990	1991	1992
Faculty Members	255	415	389
Professional Staff	17	67	92
Research Associates	33	55	71
Post doctoral Fellows	37	100	110
Technical Staff	20	89	108
Graduate Students	67	415	515
Summer Students	4	32.9	42.4
Other	143	157	9

* PY Equivalents

Table K.6.1 Number of Students in Network Research Program - Phase I*

	CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	euroscienc	Pence	Total
1990	78	no data	160	35	424	102	160	85.5			1,044.5
1991	172		275	112	435	160	187	267	291	190	2,089
1992	226		353	165	494.5	239	210	309		212	2,208.5

* PY Equivalents

Table K.8.1: Dissemination of Research Results - Phase I

		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
Peer-reviewed Articles with:												
- one author	1990	0	no data	0	3	19	2	0	9		0	33
- two authors	1990	1		4	9	61	2	0	34		1	112
- three authors	1990	0		0	10	21	1	0	25		0	57
- four or more authors	1990	1		2	8	9	15	0	11		1	47
Other articles	1990	0		4	0	0	0	0	87		0	91
Books	1990	0		0	0	4	0	0	0		0	4
Book Chapters	1990	5		0	2	7	0	0	0		0	14
Other publication	1990	0		26	0	7	0	0	0		0	33
Invited papers & lectures	1990	29		0	30	121	0	0	3		5	188
Patents applied for	1990	2		0	0	0	2	0	0		0	4
Patents issued	1990	0		0	0	2	0	0	0		0	2
Copyright items registered	1990	0		0	0	0	0	0	0		0	0
Copyright items unregistered	1990			0	0	0	1		0		0	1
Exclusive technology licences	1990	0		0	0	0	0	0	0		0	0
Non-exclusive technology licences	1990	0		0	0	0	0	0	0		0	0
Other technology licences	1990	0		0	0	0	0	0	0		0	0
Other	1990	5		0	1	0	0	0	0		0	6
Peer-reviewed Articles with:												
- one author	1991	0		6	4	57	14	0	6	1	1	89
- two authors	1991	3		28	22	201	22	17	52	25	4	374
- three authors	1991	10		16	27	93	19	21	35	40	6	267
- four or more authors	1991	12		6	22	62	68	10	18	64	11	273
Other articles	1991	0		14	16	0	2	6	100	22	0	160
Books	1991	0		0	1	6	0	0	3	5	0	15
Book Chapters	1991	5		2	5	22	12	4	2	21	0	73
Other publication	1991	0		104	13	75	0	0	0	9	0	201
Invited papers & lectures	1991	61		0	19	234	101	41	1	137	21	615
Patents applied for	1991	5		0	1	3	2	2	0	0	3	16
Patents issued	1991	0		0	0	3	1	0	0	0	0	4
Copyright items registered	1991	0		0	0	0	0	0	0	0	0	0
Copyright items unregistered	1991			0	0	0	4		0	0	0	4
Exclusive technology licences	1991	2		0	0	0	1	0	0	0	0	3
Non-exclusive technology licences	1991	0		0	0	8	2	0	0	0	0	10
Other technology licences	1991	0		0	0	0	0	0	0	0	1	1
Other	1991	45		0	2	0	4	5	0	0	0	56

Table K.8.1: Dissemination of Research Results - Phase I (continued)

Peer-reviewed Articles with:		CBDN	CGDN	CITR	Concrete	IRIS	Inspiraplex	Pulps	Micronet	Neuroscience	Pence	Total
- one author	1992	1		4	1	63	14	7	18	5	5	118
- two authors	1992	18		46	24	215	12	24	56	32	4	431
- three authors	1992	30		30	12	130	18	43	45	59	19	386
- four or more authors	1992	47		14	20	53	60	28	21	78	68	389
Other articles	1992	0		24	0	0	34	2	138	5	0	203
Books	1992	0		0	1	2	2	1	2	1	7	16
Book Chapters	1992	17		4	6	22	24	10	3	28	0	114
Other publication	1992	0		296	47	10	9	0	0	36	0	398
Invited papers & lectures	1992	87		0	20	207	133	61	12	133	110	763
Patents applied for	1992	15		0	0	4	5	9	3	11	4	51
Patents issued	1992	0		0	0	1	2	0	0	3	1	7
Copyright items registered	1992	0		0	0	0	5	0	0	0	0	5
Copyright items unregistered	1992			0	0	0	3		0	10	0	13
Exclusive technology licences	1992	4		0	0	0	1	0	0	1	0	6
Non-exclusive technology licences	1992	0		0	0	14	2	1	0	0	0	17
Other technology licences	1992	0		0	0	0	0	0	0	0	2	2
Other	1992	46		0	1	0	7	15	0	0	0	69
Peer-reviewed Articles with:												
- one author						5						5
- two authors						31						31
- three authors						16						16
- four or more authors						6						6
Other articles						0						0
Books						1						1
Book Chapters						5						5
Other publication						0						0
Invited papers & lectures						12						12
Patents applied for						1						1
Patents issued						0						0
Copyright items registered						0						0
Copyright items unregistered						0						0
Exclusive technology licences						0						0
Non-exclusive technology licences						0						0
Other technology licences						0						0
Other						0						0

Table K.8.1: Dissemination of Research Results - Phase I Totals

	Year			
	1990	1991	1992	1993
Peer-reviewed Articles with:				
- one author	33	89	118	5
- two authors	112	374	431	31
- three authors	57	267	386	16
- four or more authors	47	273	389	6
Other articles	91	160	203	0
Books	4	15	16	1
Book Chapters	14	73	114	5
Other publication	33	201	398	0
Invited papers & lectures	188	615	763	12
Patents applied for	4	16	51	1
Patents issued	2	4	7	0
Copyright items registered	0	0	5	0
Copyright items unregistered	1	4	13	0
Exclusive technology licences	0	3	6	0
Non-exclusive technology licences	0	10	17	0
Other technology licences	0	1	2	0
Other	6	56	69	0

APPENDIX L

NETWORK ANNUAL REPORTS "APPENDIX TABLE" DATA — PHASE II RENEWED NETWORKS

Appendix L: "Appendix Table" Data – Phase II Renewed Networks

The tables following are summaries of a portion of the material provided by each network to the NCE Directorate in "appendix tables" to their Annual Reports. The data relevant to this evaluation have been summarized per network, and for all networks combined. Note that there are some missing data, since some networks did not provide the appendix table material in some years. In addition, some data are estimates for the future.

The data presented here were prepared from database files provided to ARA by the NCE. Each year the NCE program officers attempt to verify each network's data and ensure that they are comparable from network (e.g., that in-kind contributions are valued in comparable ways). Although some problems remain, these data are good indicators of network performance.

Table L.1.1: Internal Agreement Signatories - Phase II

Type of Organization		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neuroscience	Pence	Totals
Universities*	**94/95**	10	17	10	23	13	15	16	15	7	126
Firms		8	0	4	1	6	0	0	0	7	26
Hospitals		3	0	0	0	1	0	0	1	2	7
Federal departments/agencies		0	0	6	0	1	1	0	0	1	9
Provincial departments/agencies		0	0	0	0	0	0	0	0	0	0
Others		1	2	0	0	1	1	0	1	1	7
Universities*	**95/96**	11	17	10	23	13	15	16	15	7	127
Firms		8	0	4	1	7	0	0	0	7	27
Hospitals		3	0	0	0	1	0	0	1	2	7
Federal departments/agencies		0	0	6	0	1	1	0	0	1	9
Provincial departments/agencies		0	0	0	0	0	0	0	0	0	0
Others		1	2	0	1	3	1	0	1	1	10
Universities*	**96/97**	11	17	11	23	14	15	17	15	6	129
Firms		8	0	4	1	7	0	0	1	9	30
Hospitals		4	0	0	0	1	0	0	0	0	5
Federal departments/agencies		0	2	5	0	0	1	0	0	1	9
Provincial departments/agencies		0	2	0	0	0	0	0	0	0	2
Others		0	0	0	0	3	1	0	2	4	10

Exhibit L.1.1: Internal Agreement Signatories - Phase II Total

	Year		
Type of Organization	**94/95**	**95/96**	**96/97**
Universities	126	127	129
Firms	26	27	30
Hospitals	7	7	5
Federal departments/agencies	9	9	9
Provincial departments/agencies	0	0	2
Other	7	10	10

* Note that the total for universities represents the number of individual network-university agreements. Since most universities have signed Internal Agreements with more than one network, the total number of individual universities involved is substantially lower than shown.

Table L.1.2 Internal Agreement Non-Signatories - Phase II

Type of Organization		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
Universities	**94/95**	1	0	1	0	2	0	4	1	0	9
Firms		3	6	43	45	26	15	19	18	2	177
Hospitals		7	0	0	2	22	0	0	10	0	41
Federal departments/agencies		0	2	3	6	4	1	2	0	0	18
Provincial departments/agencies		6	0	7	1	10	1	3	4	0	32
Others		3	0	2	0	4	0	0	0	0	9
Universities	**95/96**	1	0	1	0	2	0	4	1	0	9
Firms		3	11	47	52	29	15	21	18	2	198
Hospitals		7	0	0	2	21	0	0	10	0	40
Federal departments/agencies		0	3	5	6	10	1	2	0	0	27
Provincial departments/agencies		6	0	7	1	11	1	2	4	0	32
Others		3	0	3	8	8	0	0	0	0	22
Universities	**96/97**	1	0	0	0	0	0	3	0	0	4
Firms		16	18	61	86	21	33	30	6	7	278
Hospitals		17	0	0	0	18	0	0	0	0	35
Federal departments/agencies		3	0	4	9	8	1	2	1	0	28
Provincial departments/agencies		6	0	6	9	16	3	2	1	3	46
Others		0	0	5	3	8	0	0	10	7	33

Exhibit L.1.2: Internal Agreement Non-Signatories - Phase II Total

	Year		
Type of Organization	94/95	95/96	96/97
Universities	9	9	4
Firms	177	198	278
Hospitals	41	40	35
Federal departments/agencies	18	27	28
Provincial departments/agencies	32	32	46
Others	9	22	33

Table L.2.1: Cash Support - Phase II

Sources From		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
NCE	**94/95**	4,593,750	3,858,750	1,682,500	6,247,500	3,228,750	3,832,500	2,835,000	0	5,250,000	31,528,750
University		74,500	0	5,000	0	4,000	0	0	0	0	83,500
Industry		709,000	180,000	306,000	65,000	176,250	54,000	1,562,000	0	390,150	3,442,400
Federal		0	0	0	0	0	0	0	0	0	0
Provincial		508,500	0	314,430	0	365,744	0	0	0	0	1,188,674
Other		274,000	0	108,000	0	311,625	0	0	0	0	693,625
NCE	**95/96**	4,593,750	4,797,500	1,682,500	6,247,500	3,228,750	3,832,500	2,835,000	6,693,750	5,250,000	39,161,250
University		82,000	0	5,000	66,567	36,250	0	129,950	0	23,638	343,405
Industry		493,000	180,000	390,500	785,013	175,444	105,000	479,704	0	650,104	3,258,765
Federal		0	0	45,000	146,362	294,113	0	0	0	0	485,475
Provincial		538,500	0	86,400	234,096	603,525	15,485	142,328	205,467	30,000	1,855,801
Other		554,000	0	63,000	14,472	125,400	0	134,500	0	372,308	1,263,680
NCE	**96/97**	3,948,438	3,491,250	1,520,500	5,652,500	2,775,187	3,467,500	2,565,000	5,753,438	4,631,250	33,805,063
University		0	0	5,000	15,000	4,500	0	209,800	59,000	15,000	308,300
Industry		826,900	75,000	585,732	946,585	334,361	107,900	1,055,500	183,336	513,919	4,629,233
Federal		2,500	0	51,200	175,000	233,300	0	26,000	0	0	488,000
Provincial		154,700	187,500	113,750	245,231	596,711	15,485	141,529	204,030	156,131	1,815,067
Other		3,900,000	0	75,000	0	152,500	0	869,000	0	131,644	5,128,144
NCE	**97/98**	3,948,438	2,756,250	1,199,500	4,462,500	2,306,250	2,737,500	2,025,000	4,422,656	3,750,000	27,608,094
University		0	0	5,000	0	0	0	130,000	0	0	135,000
Industry		826,900	75,000	585,732	946,585	334,361	107,900	1,055,500	183,336	513,919	4,629,233
Federal		0	0		0		0		0	0	0
Provincial		150,000	0	191,808	0	400,000	0	140,000	0	0	881,808
Other		1,000,000	0	35,000	0	375,000	0	540,000	0	0	1,950,000
NCE	**98/99**	2,756,250	2,572,500	1,120,000	4,165,000	2,152,500	2,555,000	1,890,000	4,016,250	3,500,000	24,727,500
University		0	0	5,000	0	0	0	130,000	0	0	135,000
Industry		500,000	105,000	87,500	113,483	150,000	99,000	792,500	50,000	564,258	2,461,741
Federal		0	0	0	0	0	0		0	0	0
Provincial		0	0	182,860	0	400,000	0	140,000	0	0	722,860
Other		180,000	0	35,000	0	375,000	0	607,500	0	0	1,197,500

Exhibit L.2.1: Cash Support - Phase II Totals

	Year				
Sources From	94/95	95/96	96/97	97/98	98/99
NCE	31,528,750	39,161,250	33,805,063	27,608,094	24,727,500
University	83,500	343,405	308,300	135,000	135,000
Industry	3,442,400	3,258,765	4,629,233	4,629,233	2,461,741
Federal	0	485,475	488,000	0	0
Provincial	1,188,674	1,855,801	1,815,067	881,808	722,860
Other	693,625	1,263,680	5,128,144	1,950,000	1,197,500

Incomplete data

Table L.2.2: **In-Kind Support - Phase II**

Sources From		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
NCE	**94/95**	0	0	0	0	0	0	0	0	0	0
University		0	0	36,000	33,800	123,500	4,202,100	0	0	0	4,395,400
Industry		980,000	1,520,000	561,500	647,546	853,500	0	1,000,000	0	1,228,680	6,791,226
Federal		0	0	0	0	0	0	0	0	0	0
Provincial		0	0	62,000	0	15,000	0	0	0	0	77,000
Other		0	1,088,000	592,000	0	55,000	0	0	0	1,572,108	3,307,108
NCE	**95/96**	0	0	0		0	0	0	0	0	0
University		0	66,100	36,000	190,750	20,000	95,500	52,000	0	1,000	461,350
Industry		698,000	1,320,000	690,850	1,108,095	686,450	4,175,396	1,024,300	0	1,233,680	10,936,771
Federal		0	0	162,500	344,925	177,800	13,000	0	0		698,225
Provincial		150,000	0	0	51,589	32,300	0	0	0	195,000	428,889
Other		0	888,000	205,000	46,999	59,000	0	79,500	0	1,145,212	2,423,711
NCE	**96/97**	0	0	0	0	0	0	0	0	0	0
University		0	101,700	34,000	25,000	22,100	95,500	217,000	0	0	495,300
Industry		445,400	1,555,820	1,204,380	1,980,288	687,020	4,233,946	940,000	192,000	1,229,081	12,467,935
Federal		0	703,100	318,000	118,250	146,500	13,000	20,000	0	628,700	1,947,550
Provincial		480,000	74,060	62,000	92,849	16,000	0	0	0	0	724,909
Other		326,000	51,400	145,500	59,849	39,000	0	50,000	0	0	671,749
NCE	**97/98**	0	0	0	0	0	0	0	0	0	0
University		0	0	34,000	25,000	0	0	50,000	0	0	109,000
Industry		500,000	1,555,000	595,400	319,794	400,000	2,639,381	1,000,000	150,000	1,351,680	8,511,255
Federal		0	0		0		0		0		0
Provincial		450,000	0	32,000	0	10,000	0	0	0	0	492,000
Other		3,000,000	1,238,000	694,000	25,000	150,000	0	80,000	0	1,624,374	6,811,374
NCE	**98/99**	0	0	0	0	0	0	0	0	0	0
University		0	0	34,000	25,000	0	0	50,000	0	0	109,000
Industry		538,000	1,555,000	421,900	224,667	400,000	2,507,100	1,000,000	150,000	1,262,680	8,059,347
Federal		0	0		0	0	0	0	0	0	0
Provincial		0	0	32,000	0	10,000	0	0	0	0	42,000
Other		0	1,238,000	597,000	25,000	150,000	0	80,000	0	1,644,596	3,734,596

Exhibit L.2.2: **In Kind Support - Phase II Totals**

	Year				
Sources From	**94/95**	**95/96**	**96/97**	**97/98**	**98/99**
NCE	0	0	0	0	0
University	4,395,400	461,350	495,300	109,000	109,000
Industry	6,791,226	10,936,771	12,467,935	8,511,255	8,059,347
Federal	0	698,225	1,947,550	0	0
Provincial	77,000	428,889	724,909	492,000	42,000
Other	3,307,108	2,423,711	671,749	6,811,374	3,734,596

Incomplete data

Table L.4.1: Collaboration: Number of Individuals and Organizations Involved - Phase II

Collaboration		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
Total researchers	**94/95**	63	70	79	167	100	61	96	0	0	636
Universities*		28	36	31	49	43	36	36	0	0	259
Government agencies		0	3	19	7	3	3	4	0	0	39
Firms		20	21	39	19	10	19	25	0	0	153
Others		35	2	0	2	50	0	0	0	0	89
Total researchers	**95/96**	64	59	79	154	78	61	89	136	54	774
Universities*		29	18	31	53	13	36	36	37	7	260
Government agencies		0	2	19	9	4	3	4	0	1	42
Firms		21	11	39	52	12	19	21	21	7	203
Others		35	4	0	10	28	0	0	9	3	89
Total researchers	**96/97**	70	355	91	143	74	61	89	135	72	1,090
Universities*		49	34	11	23	14	36	31	40	20	258
Government agencies		0	4	12	9	2	6	4	0	4	41
Firms		42	14	35	52	23	32	32	15	7	252
Others		0	1	4	10	25	0	0	17	5	62

Table L.4.1: Collaboration: Number of Individuals and Organizations Involved - Phase II Totals

Collaboration	Year		
	94/95	95/96	96/97
Total researchers	636	774	1090
Universities*	259	260	258
Government agencies	39	42	41
Firms	153	203	252
Others	89	89	62

* Note that the total for universities represents the number of individual network-university agreements. Since most universities have signed Internal Agreements with more than one network, the total number of individual universities involved is substantially lower than shown.

Table L.5.1: Personnel Supported by NCE Funds - Phase II*

Network Research Personnel		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
Faculty members	94/95	0	1	0	0	0	0	0	0	1	2
Industry		0	0	0	0	0	0	0	0	0	0
Hospitals		0	0	0	0	0	0	0	0	0	0
Federal Departments/agencies		0	0	0	0	0	0	0	0	0	0
Provincial Departments/agencies		0	0	0	0	0	0	0	0	0	0
Other		0	0	0	0	0	0	0	0	0	0
Research Associates		14	31	8	42	11	6	19	0	5	136
Post Doctoral Fellows		14	8	6	17	10	42	16	0	55	168
Technical Staff		37	9	8	0	24	0	8	0	19	105
Graduate Students		16	123	25	101	7	48	158	0	34	512
Summer/Undergrad Students		5	9	9	0	15	25	3	0	6.5	72.5
Faculty members	95/96	0	2	0	0	0	0	0	0	1	3
Industry		0	0	0	0	0	0	0	1	0	1
Hospitals		0	0	0	0	0	0	0	2	0	2
Federal Departments/agencies		0	0	0	0	0	0	0	0	0	0
Provincial Departments/agencies		0	0	0	0	0	0	0	0	0	0
Other		0	0	0	0	0	0	0	0	0	0
Research Associates		20	14	8	32	11	6	17	7	7	122
Post Doctoral Fellows		20	8	7	40	13	42	12	10.7	32	184.7
Technical Staff		49	7	7	42	24	0	7	30.6	24	190.6
Graduate Students		29	103	29	173	15	48	172	29	17	615
Summer/Undergrad Students		8	6	10	24	14	25	6	2.5	13	108.5
Faculty members	96/97	0	1	0	0	0	0	0	0	0	1
Industry		0	0	0	0	0	0	0	0	2	2
Hospitals		0	0	0	0	0	0	0	0	2	2
Federal Departments/agencies		0	0	0	0	0	0	0	0	10	10
Provincial Departments/agencies		0	22	0	0	0	0	0	0	0	22
Other		0	0	1	0	0	0	0	0	0	1
Research Associates		8	21	2.83	37	10.25	6	19	16	12	132.08
Post Doctoral Fellows		16	14	4.72	40	15	42	10	21	49	211.72
Technical Staff		34.25	10	2.8	44	32.5	0	7	37	30	197.55
Graduate Students		33	137	27.67	183	12.83	47	178	39	29.5	687
Summer/Undergrad Students		6	14	1.83	24	6.3	20	9	10	2	93.13

Table L.5.1: Personnel Supported by NCE Funds - Phase II Totals*

	Year		
Network Research Personnel	94/95	95/96	96/97
Faculty members	2	3	1
Industry	0	1	2
Hospitals	0	2	2
Federal Departments/agencies	0	0	10
Provincial Departments/agencies	0	0	22
Other	0	0	1
Research Associates	136	122	132.1
Post Doctoral Fellows	168	184.7	211.7
Technical Staff	105	190.6	197.6
Graduate Students	512	615	687
Summer/Undergrad Students	72.5	108.5	93.1

* PY Equivalents

Table L.5.2: Personnel Supported by Non-NCE Funds - Phase II*

Network Research Personnel		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
Faculty members	94/95	17	47	16	120	80	46	87		33	446
Industry		15	0	53	18	5	13	0		10	114
Hospitals		20	0	0	2	0	0	0		7	29
Federal Departments/agencies		0	2	9	6	3	2	0		2	
Provincial Departments/agencies		0	0	7	0	0	0	0		0	7
Other		0	0	2	0	0	0	0		0	2
Research Associates		9	8	12	4	12	0	1		16	62
Post Doctoral Fellows		39	3	3	1	17	1	3		7	74
Technical Staff		41	6	8	0	15	8	1		14	93
Graduate Students		59	63	22	11	13	0	43		10	221
Summer/Undergrad Students		58	6	17	0	7	1	0		2	91
Faculty members	95/96	17	53	25	118	73	46	81	130	33	576
Industry		15	2	7	11	7	13	0	1	11	67
Hospitals		20	0	0	0	5	0	0	4	8	37
Federal Departments/agencies		0	4	6	6	0	2	0	0	2	20
Provincial Departments/agencies		0	0	0	0	0	0	0	0	0	0
Other		0	0	0	4	0	0	0	0	0	4
Research Associates		11	17	10	29	12	0	3	9.3	3	94.3
Post Doctoral Fellows		41	3	5	25	38	1	1	14.6	13	141.6
Technical Staff		46	5	7	27	27	8	1	15.5	14	150.5
Graduate Students		64	62	30	156	29	0	55	25	14	435
Summer/Undergrad Students		60	9	15	25	10	1	0	6	2	128
Faculty members	96/97	37	65	14.7	118	72	64	84	105	55	614.7
Industry		0	0	0.2	11	3	13.4	0	0	29	56.6
Hospitals		22	0	0	0	0	0	0	0	12	34
Federal Departments/agencies		0	8	1.83	6	1	4.2	0	0	19	40.03
Provincial Departments/agencies			11	1	0	0	0.4	0	0	0	12.4
Other		0	0	0	10	0	0	0	0	0	10
Research Associates		13	10	5.5	34	18.75	2	3	13	14	113.25
Post Doctoral Fellows		54	8	5.53	27	38	1	1	33	20	187.53
Technical Staff		41.55	6	9.15	31	27	15	1	32	28	190.7
Graduate Students		53	67	30	166	27.16	0	60	46	18.5	467.66
Summer/Undergrad Students		13	7	12.56	25	12.7	0	3	21	7	101.26

Table L.5.2: Personnel Supported by Non-NCE Funds - Phase II Totals*

	Year		
Network Research Personnel	94/95	95/96	96/97
Faculty members	446	576	614.7
Industry	114	67	56.6
Hospitals	29	37	34
Federal Departments/agencies		20	40.03
Provincial Departments/agencies	7	0	12.4
Other	2	4	10
Research Associates	62	94.3	113.25
Post Doctoral Fellows	74	141.6	187.53
Technical Staff	93	150.5	190.7
Graduate Students	221	435	467.66
Summer/Undergrad Students	91	128	101.26

* PY Equivalents

Table L.6.1: Number of Graduate Students Working on Network Research - Phase II*

Level of Study		Citizenship	CBDN	CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
PhDs	94/95	Canadian		23		8	86	5	26	70	28	11	257
PhDs		Canadian		14		4	9	7	3	3	23	7	70
Master		Canadian		5		9	68	2	16	64	23	4	191
Master		Canadian		18		4	17	1	10	3	7	2	62
PhDs		Foreign	27	8		15	35	3	10	30	11	1	140
PhDs		Foreign	24	7	76	2	10	1	2	2	12	0	136
Master		Foreign	38	2		5	31	1	5	27	9	0	118
Master		Foreign	30	8	110	0	4	0	2	2	9	0	165
PhDs	95/96	Canadian		29	24	8	71.5	11	25	62	17	11	258.5
PhDs		Canadian		20	4	4	11	7	3	2	15	5	71
Master		Canadian		7	54	13	65	6	13	82	18	4	262
Master		Canadian		18	6	9	11	10	9	11	4	4	82
PhDs		Foreign	25	12	34	15	24	6	7	44	7	3	177
PhDs		Foreign	28	7	0	3	9	3	1	1	8	1	61
Master		Foreign	18	3	19	7	29.5	0	1	21	6	0	104.5
Master		Foreign	14	8	4	0	15	2	5	4	6	2	60
PhDs	96/97	Canadian	21	17	38	18	130	11	22	69	14	23	363
PhDs		Canadian	22	12	3	4	26	8	5	6	16	8	110
Master		Canadian	5	13	76	18	108	3	19	87	10	4	343
Master		Canadian	6	16	10	9	35	4	9	14	8	6	117
PhDs		Foreign	4	14	35	12	69	4	8	37	5	1	189
PhDs		Foreign	5	8	0	2	15	3	2	3	6	2	46
Master		Foreign		6	27	6	55	4	4	18	1	2	123
Master		Foreign		0	12	3	8	2	5	3	0	0	33

Table L.6.1: Number of Graduate Students Working on Network Research - Phase II Totals*

		Year		
Level of Study		94/95	95/96	96/97
PhDs	Canadian	327	329.5	473
	Foreign	276	238	235
Masters	Canadian	253	344	460
	Foreign	283	164.5	156

* PY Equivalents

Table L.7.1: Post-Network Employment of Graduate Students and Postdocs - Phase II

Sector		Country	CBDN	CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
Gov't	96/97	Canada	4	1	4	2	2	1	2	0	0	1	17
Gov't		USA	1	1	0	0	1	0	0	0	0	3	6
Gov't		Other	0	0	4	2	0	0	0	0	0	1	7
Industry		Canada	6	3	45	7	54	0	18	60	0	3	196
Industry		USA	0	2	4	0	10	0	1	18	1	1	37
Industry		Other	0	0	2	3	2	0	5	0	0	2	14
Other		Canada	0	6	0	2	4	3	1	0	12	0	28
Other		USA	0	0	0	0	0	2	0	0	3	0	5
Other		Other	0	0	0	0	0	3	1	0	2	0	6
University		Canada	6	2	4	2	17	1	7	9	5	1	54
University		USA	2	3	0	0	6	1	1	0	0	3	16
University		Other	3	6	9	0	6	3	4	0	2	4	37

Table L.7.1: Post-Network Employment of Graduate Students and Postdocs - Phase II Totals

		Year
Sector	Country	96/97
Government	Canada	17
	USA	6
	Other	7
Industry	Canada	196
	USA	37
	Other	14
Other	Canada	28
	USA	5
	Other	6
University	Canada	54
	USA	16
	Other	37

Table L.8.1: Dissemination of Research Results - Phase II

		CGDN	CITR	Concrete	IRIS	Inspira	Pulps	Micronet	Neurosc	Pence	Totals
Articles(Peer)authored from one research	**95/96**	80	20	67	60	44	62	0	0	33	366
Articles(Peer)authored from two+ research groups		27	1	16	27	63	15	0	0	72	221
Other articles from one research group		0	0	10	137	0	12	0	0	8	167
Other articles from two+ research groups		0	1	9	57	0	1	0	0	11	79
Presentations authorize from one research group		0	59	39	144	45	65	0	0	60	412
Presentations authorize from two+ research groups		0	16	3	38	93	11	0	0	35	196
Non-disclosure agreements signed		11	0	3	12	14	10	0	0	0	50
Patent applications filed		9	0	2	1	4	4	0	0	5	25
Patents issued		0	0	1	0	1	2	0	0	1	5
Copyrights		0	0	0	19	1	0	0	0	0	20
Licences under negotiation		3	0	2	8	4	0	0	0	0	17
Licenses granted to industry		2	0	0	0	1	1	0	0	0	4
Start-up companies		1	0	0	5	0	0	0	0	0	6
Articles(Peer)authorize from one research	**96/97**	195	54	52	192	34	54	53	89	17	740
Articles(Peer)authorize from two+ research groups		70	5	43	37	86	15	37	32	20	345
Other articles from one research group		60	4	4	277	21	8	0	0	6	380
Other articles from two+ research groups		11	0	4	94	44	1	0	0	10	164
Presentations authorize from one research group		300	112	57	398	90	60	88	0	103	1208
Presentations authorize from two+ research groups		33	38	20	37	170	14	49	0	13	374
Non-disclosure agreements signed		12	0	0	41	15	9	0	31	0	108
Patent applications filed		6	1	3	11	8	4	0	16	11	60
Patents issued		0	0	1	3	2	1	0	3	4	14
Copyrights		0	0	0	48	1	0	0	3	0	52
Licences under negotiation		4	0	2	7	6	2	0	13	13	47
Licenses granted to industry		3	0	1	8	3	0	0	11	11	37
Start-up companies		0	0	0	5	3	0	0	6	2	16

Table L.8.1: Dissemination of Research Results - Phase II Totals

	Year	
	95/96	96/97
Articles(Peer)authored from one research group	366	740
Articles(Peer)authored from two+ research groups	221	345
Other articles from one research group	167	380
Other articles from two+ research groups	79	164
Presentations authorize from one research group	412	1208
Presentations authorize from two+ research groups	196	374
Non-disclosure agreements signed	50	108
Patent applications filed	25	60
Patents issued	5	14
Copyrights	20	52
Licences under negotiation	17	47
Licenses granted to industry	5	39
Start-up companies	6	16

APPENDIX M

NETWORK ANNUAL REPORTS "APPENDIX TABLE" DATA — PHASE II NEW NETWORKS

Appendix M: "Appendix Table" Data – Phase II New Networks

The tables following are summaries of a portion of the material provided by each network to the NCE Directorate in "appendix tables" to their Annual Reports. The data relevant to this evaluation have been summarized per network, and for all networks combined. Note that there are some missing data, since some networks did not provide the appendix table material in some years. In addition, some data are estimates for the future.

The data presented here were prepared from database files provided to ARA by the NCE. Each year the NCE program officers attempt to verify each network's data and ensure that they are comparable from network to network (e.g., that in-kind contributions are valued in comparable ways). Although some problems remain, these data are good indicators of network performance.

Table M.1.1 Internal Agreement Signatories - Phase II

Type of Organization		ISIS	HealNet	SFM	Telelearning	Total
Universities*	94/95	11	16	23	29	79
Firms		3	5	10	13	31
Hospitals		0	0	0	0	0
Federal departments/agencies		0	0	1	2	3
Provincial departments/agencies		0	1	1	0	2
Others		0	3	4	4	11

Table M.1.1 Internal Agreement Signatories - Phase II Totals

	Year
Type of Organization	94/95
Universities*	79
Firms	31
Hospitals	0
Federal departments/agencies	3
Provincial departments/agencies	2
Other	11

* Note that the total for universities represents the number of individual network-university agreements. Since most universities have signed Internal Agreements with more than one network, the total number of individual universities involved is substantially lower.

Table M.1.2 Internal Agreement Non-Signatories - Phase II

Type of Organization		ISIS	HealNet	SFM	Telelearning	Totals
Universities	94/95	0	0	1	0	1
Firms		19	22	2	5	48
Hospitals		0	0	0	0	0
Federal departments/agencies		3	0	7	0	10
Provincial departments/agencies		7	2	2	0	11
Others		4	2	9	0	15

Table M.1.2 Internal Agreement Non-Signatories - Phase II Totals

	Year
Type of Organization	94/95
Universities	1
Firms	48
Hospitals	0
Federal departments/agencies	10
Provincial departments/agencies	11
Others	15

Table M.2.1 Cash Support - Phase II

Sources From		ISIS	HealNet	SFM	Telelearning	Totals
NCE	**94/95**	1,547,000	1,400,000	1,758,000	2,132,000	6,837,000
University		32,000	0	80,000	0	112,000
Industry		276,032	50,000	445,000	133,500	904,532
Federal		0	0	224,740	20,000	244,740
Provincial		231,583	0	901,000	260,000	1,392,583
Other		0	0	394,837	30,000	424,837
NCE	**95/96**	2,651,000			3,656,000	6,307,000
University		0			0	0
Industry		458,200			273,500	731,700
Federal		0			40,000	40,000
Provincial		397,000			500,000	897,000
Other		0			40,000	40,000
NCE	**96/97**	2,651,000			3,656,000	6,307,000
University		0			0	0
Industry		418,200			266,000	684,200
Federal		0			40,000	40,000
Provincial		397,000			500,000	897,000
Other		0			40,000	40,000
NCE	**97/98**	2,651,000			3,656,000	6,307,000
University		0			0	0
Industry		418,200			266,000	684,200
Federal		0			40,000	40,000
Provincial		397,000			500,000	897,000
Other		0			40,000	40,000

Table M.2.1 Cash Support - Phase II Totals

	Year			
Sources From	**94/95**	**95/96**	**96/97**	**97/98**
NCE	6,837,000	6,307,000	6,307,000	6,307,000
University	112,000	0	0	0
Industry	904,532	731,700	684,200	684,200
Federal	244,740	40,000	40,000	40,000
Provincial	1,392,583	897,000	897,000	897,000
Other	424,837	40,000	40,000	40,000

Table M.2.2 In Kind Support - Phase II

Sources From		ISIS	HealNet	SFM	Telelearning	Totals
NCE	94/95		0	0	0	0
University		133,000	99,501	47,500	150,000	430,001
Industry		196,351	515,071	0	1,306,600	2,018,022
Federal		0	0	110,000	23,500	133,500
Provincial		12,250	297,501	40,000	0	349,751
Other		93,333	92,085	0	0	185,418
NCE	95/96				0	0
University		280,000			300,000	580,000
Industry		336,600			2,104,600	2,441,200
Federal		0			51,200	51,200
Provincial		19,000			0	19,000
Other		160,000			0	160,000
NCE	96/97				0	0
University		280,000			300,000	580,000
Industry		341,100			2,097,100	2,438,200
Federal		0			51,150	51,150
Provincial		20,000			0	20,000
Other		160,000			0	160,000
NCE	97/98				0	0
University		280,000			300,000	580,000
Industry		343,100			2,097,100	2,440,200
Federal		0			51,150	51,150
Provincial		20,000			0	20,000
Other		160,000			0	160,000

Table M.2.2 In Kind Support - Phase II Totals

	Year			
Sources From	94/95	95/96	96/97	97/98
NCE	0	0	0	0
University	430,001	580,000	580,000	580,000
Industry	2,018,022	2,441,200	2,438,200	2,440,200
Federal	133,500	51,200	51,150	51,150
Provincial	349,751	19,000	20,000	20,000
Other	185,418	160,000	160,000	160,000

Table M.4.1 Collaboration: Number of Individuals and Organizations Involved - Phase II

Collaboration		ISIS	HealNet	SFM	Telelearning	Totals
Total researchers	94/95	42	96	101	194	433
Universities*		19	32	39	79	169
Fed. Gov't		0	2	7	4	13
Prov. Gov't		13	2	7	2	24
Industry		31	7	15	19	72
Others		0	7	6	20	33

Table M.4.1 Collaboration: Number of Individuals and Organizations Involved - Phase II Totals

	Year
Collaboration	94/95
Total researchers	433
Universities*	169
Fed. Gov't	13
Prov. Gov't	24
Industry	72
Others	33

* Note that the total for universities represents the number of individual network-university agreements. Since most universities have signed Internal Agreements with more than one network, the total number of individual universities involved is substantially lower.

Table M.5.1 Personnel Supported by NCE Funds - Phase II*

Network Research Personnel		ISIS	HealNet	SFM	Telelearning	Totals
Faculty members	94/95	0	0	80	0	80
Industry		0	0	0	0	0
Hospitals		0	0	0	0	0
Federal Departments/agencies		0	0	0	0	0
Provincial Departments/agencies		0	0	0	0	0
Other		0	0	0	0	0
Research Associates		6.5	0	9	0	15.5
Post Doctoral Fellows		5	0	21	0	26
Technical Staff		6	4	19	0	29
Graduate Students		18	8	105	0	131
Summer/Undergrad Students		1	9	58	0	68

Table M.5.1 Personnel Supported by NCE Funds - Phase II Totals*

	Year
Network Research Personnel	94/95
Faculty members	80
Industry	0
Hospitals	0
Federal Departments/agencies	0
Provincial Departments/agencies	0
Other	0
Research Associates	16
Post Doctoral Fellows	26
Technical Staff	29
Graduate Students	131
Summer/Undergrad Students	68

* PY Equivalents

Table M.5.2 Personnel Supported by Non-NCE Funds - Phase II*

Network Research Personnel		ISIS	HealNet	SFM	Telelearning	Totals
Faculty members	94/95	34	66	18	125	243
Industry		19.5	0	0	2	21.5
Hospitals		0	0	0	0	0
Federal Departments/agencies		0	0	0	1	1
Provincial Departments/agencies		7.4	1	0	0	8.4
Other		3.6	0	0	0	3.6
Research Associates		5.5	4	3	0	12.5
Post Doctoral Fellows		1.5	2	1	0	4.5
Technical Staff		21.5	2	6	0	29.5
Graduate Students		9	7	9	0	25
Summer/Undergrad Students		1	6	1	3	11

Table M.5.2 Personnel Supported by Non-NCE Funds - Phase II Totals*

Network Research Personnel	Year
	94/95
Faculty members	243
Industry	21.5
Hospitals	0
Federal Departments/agencies	1
Provincial Departments/agencies	8.4
Other	3.6
Research Associates	12.5
Post Doctoral Fellows	4.5
Technical Staff	29.5
Graduate Students	25
Summer/Undergrad Students	11

* PY Equivalents

Table M.6.1: Number of Graduate Students Working on Network Research - Phase II

Level of Study			ISIS	HealNet	SFM	Telelearning	Totals
PhDs	94/95	Canadian	16	1	no data	no data	17
PhDs		Canadian	4	1			5
Master		Canadian	18	7			25
Master		Canadian	3	6			9
PhDs		Foreign	1	1			2
PhDs		Foreign	0	1			1
Master		Foreign	0	7			7
Master		Foreign	1	6			7

Table M.6.1: Number of Graduate Students Working on Network Research - Phase II Totals

		Year
Level of Study		94/95
PhDs	Canadian	22
	Foreign	3
Masters	Canadian	34
	Foreign	14

Table M.8.1: Dissemination of Research Results - Phase II

		ISIS	HealNet	SFM	Telelearning	Totals
Articles(Peer)authorize from one research group	**94/95**	58	58	58	58	232
Articles(Peer)authorize from two+ research groups		2	2	2	2	8
Other articles from one research group						
Other articles from two+ research groups						
Presentations authorize from one research group						
Presentations authorize from two+ research groups						
Non-disclosure agreements signed						
Patent applications filed						
Patents issued						
Copyrights						
Licences under negotiation						
Licenses granted to industry						
Start-up companies						

Table M.8.1: Dissemination of Research Results - Phase II Totals

	Year
	94/95
Articles(Peer)authorize from one research group	232
Articles(Peer)authorize from two+ research groups	8
Other articles from one research group	
Other articles from two+ research groups	
Presentations authorize from one research group	
Presentations authorize from two+ research groups	
Non-disclosure agreements signed	
Patent applications filed	
Patents issued	
Copyrights	
Licences under negotiation	
Licenses granted to industry	
Start-up companies	

APPENDIX N

SURVEY INSTRUMENTS

Survey of NCE Researchers — Renewed Networks

Any references to the "non-NCE sources" of research support refers to funding through non-NCE programs of the university granting councils, other university grants, provincial research organizations, industry, hospitals, foundations, and so forth. All replies will be kept strictly confidential and results will only be presented in aggregate form. Thank you for your cooperation.

Background

1. Of which network are you a member? ______________________________
(In questions below, this will be called "your network")

2. Are you currently employed primarily by:

☐1 A university
☐2 A private sector company
☐3 A hospital
☐4 A government organization
☐5 Other. What? ______________________________

3. For how long have you been an active independent researcher? ☐ Years

Impact of the NCE Program on Research

4. On average, roughly what amount of research funding have you been awarded annually? Only include your portion of jointly-held grants. Do not adjust for inflation. **Please enter "0" if zero.**

In the 5 years prior to joining your network	Since you joined your network	Note: a = b+c
$ ☐	$ ☐	a) Approximate annual average total research funding from all sources.
$ ☐	$ ☐	b) Portion of total that is from your network
$ ☐	$ ☐	c) Portion of total from non-NCE funding sources

5. Roughly what has been the proportional split between your fundamental and applied research funding?

	In the 5 years prior to joining the network	Since joining the network
Fundamental	☐ %	☐ %
Applied	☐ %	☐ %

6. If either your total research funding has changed since joining your network, or the balance of effort between fundamental and applied research has changed, what influence did participation in your network have on these changes?

	Major influence	Minor influence	No influence	Don't know	Not applicable (no significant change)
Influence on total funding	☐1	☐2	☐3	☐4	☐5
Influence on balance of effort	☐	☐	☐	☐	☐

7. (a) We are interested in your opinion on the relative impact on your research of various features of your network. Please note the impact on your network research of each of the following, using a scale of -5 to +5, where -5 = Major negative impact; 0 = No impact; and +5 = Major positive impact. Use D/K for "Don't Know".

Impact of the extra research funding you received through your network	☐
Impact of your network's networking and collaboration	☐
Impact of your network's management	☐
Impact of interactions with external sources (e.g., industry, government, hospitals)	☐
Impact of your network's support for training highly qualified people	☐

Other impact. What? ____________________

7. (b) Of the positive impact — if any — of the network on your research, roughly what percentage is due to the extra research funding, and what percentage is due to other factors such as networking, management, and training? Use D/K for "Don't Know".

☐ Not applicable — impacts are not positive

☐ % Due to extra research funding

☐ % Due to other factors

8. Is **your NCE research** different from the type of research you were doing prior to joining the network?

☐ Yes

☐ No

If yes, in what ways is it different? (Check all that apply.)

☐1 The NCE work is in a new field of research for me, or addressed new topics, or tried new approaches

☐2 The NCE work involves important links to other disciplines

☐3 The NCE work involves important new collaborations

☐4 The NCE work is more oriented towards needs of industry

☐5 The NCE work is more oriented towards needs of government

☐6 The NCE work is more oriented towards health care or social needs

☐7 Other; what? ____________________

9. Has your participation in the network had any impact on **your general research program** (i.e., the part of your work funded by non-NCE sources)?

☐ Yes

☐ No

☐ Not applicable: All my work is on NCE research

If yes, in what ways has it changed? (Check all that apply.)

☐1 Because of NCE, I entered a new field of research in my other work, or addressed new topics or tried new approaches.

☐2 My non-NCE work involves important links to other disciplines facilitated by the network

☐3 My non-NCE work involves important new collaborations created through the network

☐4 My non-NCE work is more oriented towards industry needs because of the network

☐5 My non-NCE work is more oriented towards government needs because of the network

☐6 My non-NCE work is more oriented towards health care or social needs because of the network

☐7 Other; what? ____________________

10. Has the NCE changed your attitude about either collaborative or applied research?

	More positive attitude now	**No change in attitude**	**More negative attitude now**
Collaborative research	☐	☐	☐
Applied Research	☐	☐	☐

If there has been a change in your attitude towards collaborative or applied research, explain:

11. How many people work on your research team? (The source of funding is irrelevant. Include investigators outside your lab if they are making a significant contribution to your network.) Answer in full-time equivalents if appropriate. **Please enter "0" if zero.**

In the 5 years prior to joining your network	**Since joining your network**	
☐	☐	Senior investigators at your university (Including yourself)
☐	☐	Senior investigators at other universities
☐	☐	Senior industry investigators (including yourself, if appropriate)
☐	☐	Senior investigators from organizations such as government and hospitals (including yourself, if appropriate)
☐	☐	Postdoctoral fellows
☐	☐	Graduate students
☐	☐	Other research assistants or associates
☐	☐	Technicians

12. Approximately what proportion of your research has been multidisciplinary in nature? (This could be either through your own work in more than one discipline, or through being part of a multi-disciplinary team.)

In your NCE research	**In your non-NCE research**	
☐ %	☐ %	Since you joined your network
N/A	☐ %	In the same period before you joined your network

If there has been a change in the degree of multidisciplinarity over time, what influence did your network have?

	Major influence	**Minor influence**	**No influence**	**Don't know**	**Not applicable — no change**
In your NCE work	☐^{1}	☐^{2}	☐^{3}	☐^{4}	☐^{5}
In your non-NCE work	☐	☐	☐	☐	☐

13. We are interested in any differences in the scientific merit of your network research, compared to that supported by non-NCE sources. In your opinion, roughly what proportion of your research falls into the following categories?

	World-class	Excellent	Good	Fair	Poor	TOTAL
Your network research	%	%	%	%	%	100%
Your non-NCE research	%	%	%	%	%	100%

If the scientific merit of your NCE and non-NCE research differ in any way, please explain why:

____

____

____

____

14. Is there any difference in terms of the degree of scientific risk of network research projects compared to those supported by non-NCE funding sources (i.e., where "high risk" implies the work is more speculative or the outcome is less certain)?

☐1 The network supports relatively more risky, original research than non-NCE sources do

☐2 The network supports relatively more conservative, traditional research than non-NCE sources do

☐3 There is not much difference in terms of the degree of risk

☐4 Don't know

Impact on Development of Highly Qualified People

15. Since 1989, did you leave a position in another country to accept a research position in Canada?

☐ Yes ☐ No

If Yes, how important was the existence of your network in making the decision to move to Canada?

☐1 Very important

☐2 Moderately important

☐3 Slightly important

☐4 Not important

☐5 Don't know

16. Since 1989 (or since you moved to Canada, if applicable) have you seriously considered accepting a research position outside Canada?

☐ Yes ☐ No

If Yes, how important was the existence of your network in making the decision to stay in Canada?

☐1 Very important

☐2 Moderately important

☐3 Slightly important

☐4 Not important

☐5 Don't know

17. Does your network affect the type of training provided to younger researchers (i.e., postdoctoral fellows and graduate students), compared to the training for similar researchers supported through non-NCE sources? Use this scale: 1 = NCE provides poorer training; 2 = NCE training is about the same; 3 = NCE provides better training. Use D/K for "Don't Know", or N/A if your network provides no training.

Training for postdoctoral fellows	Training for graduate students	Type of Impact
☐	☐	Overall quality of scientific training
☐	☐	Exposure to users in industry, government, health care
☐	☐	Involvement in research project planning and management
☐	☐	Experience with state-of-the-art equipment
☐	☐	Making professional contacts and networking
☐	☐	Impact on prestige and career
☐	☐	Ability to find a job

If NCE training differs from non-NCE training, please explain:

Network Management

18. Does your network have an effective management system for the following purposes?

	Yes	Partial success	No	Don't know
Selecting themes that cover the major fields necessary to achieve success in the network's overall goals	☐^{1}	☐^{2}	☐^{3}	☐^{4}
Selecting individual research projects that fit into the network themes	☐	☐	☐	☐
Allocating or changing support to individual projects	☐	☐	☐	☐
Identifying research results with potential for commercial or social benefits	☐	☐	☐	☐
Communicating NCE activities within the network	☐	☐	☐	☐
Communicating NCE activities outside the network	☐	☐	☐	☐

Please comment:

19. What have been the major impacts, pro and con, of your **network management** for your research?

Positive impacts:

____

____

____

____

____

Negative impacts:

____

____

____

____

____

Collaboration and Networking

20. How much collaboration and networking have you had with other parties since joining the network, compared to prior to joining your network? Rate as since joining your network you have had: 1 = Much Less; 2 = Less; 3 = About the Same; 4 = More; 5 = Much More. (Partial scores e.g., 3.6 are acceptable. Use D/K for "Don't Know" and N/A for "Not Applicable".) **Please answer "None" if you have had no such interaction.**

	Helping plan your research	Helping carry our your research	Helping apply your results
With university researchers	☐	☐	☐
With industry representatives	☐	☐	☐
With government representatives	☐	☐	☐
With hospital or health care representatives	☐	☐	☐

21. Since you have been in your network, has the amount of collaboration in your network research changed? Include any collaboration with people outside the network if this is relevant to your network research.

	Decreased over time	About the same	Increased over time	Don't know
With university researchers	☐1	☐2	☐3	☐4
With industry	☐	☐	☐	☐
With government	☐	☐	☐	☐
With hospital or health care representatives	☐	☐	☐	☐
With others. Who? ____________________	☐	☐	☐	☐

22. In the current research environment, there are many factors that affect the degree of research networking and collaboration. How important was the influence of your network, versus other factors, on the amount of networking and collaboration you have undertaken recently?

- ☐1 The network was the most important factor
- ☐2 The network and other factors were about equal in importance
- ☐3 Other factors were more important than the network. What? ____________________
- ☐4 Not applicable: the extent of my networking and collaboration has not changed
- ☐8 Don't know

23. What have been the major impacts, pro and con, of the **network collaboration** on your research?

Positive impacts:

____

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Negative impacts:

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____

Subsequent Application of Research Results

24. What kind of practical applications are likely from your network research? (Please check all that apply.)

- ☐1 No practical applications are likely

There will likely be application to:

- ☐2 Policies or regulations of government agencies
- ☐3 Policies or regulations of hospitals or other health care organizations (e.g., NGOs)
- ☐4 Policies or regulations of industry
- ☐5 Disease/injury diagnosis, treatment, or identification of risk factors
- ☐6 Social impacts such as improved education, care of the elderly, quality of life, better environment
- ☐7 The R&D topics addressed by private sector companies
- ☐8 The R&D capability of private sector companies
- ☐9 Applications for patents, licences, or other intellectual property protection
- ☐10 Further R&D investments being made by the private sector or the investment community.
- ☐11 New products, processes, or services being actively developed by or for industry
- ☐12 New jobs being created, or jobs being retained that would have been lost otherwise
- ☐13 Other. What? ____________________

In roughly what time period are these applications likely to occur?

☐1 Some have already occurred
☐2 In the next 5 years
☐3 6-10 years from now
☐4 More than 10 years from now
☐5 Don't Know

If your NCE research has already had any impacts such as those above, please explain:

Impact of Phase II Policies

25. In Phase II of the NCE program, the goals and policies were revised somewhat compared to Phase I. How well informed have you been about these changes?

☐1 Very well informed
☐2 Moderately well informed
☐3 Not very well informed
☐4 Not at all informed

What is your understanding of how Phase II differs from Phase I?

26. How have the new Phase II goals and policies affected the following?

	Higher	No change due to revisions	Lower	Don't Know
Your satisfaction with the NCE program's goals and policies	☐1	☐2	☐3	☐4
Your satisfaction with your network's goals and policies	☐	☐	☐	☐
Your willingness to stay in your network	☐	☐	☐	☐
The proportion of your total research focused on long-term fundamental science	☐	☐	☐	☐
The proportion of your total research focused on research of interest to industry, government, or health care	☐	☐	☐	☐
Other. What?	☐	☐	☐	☐

27. To what degree do you think the NCE program and your network are achieving the Phase II goals? (Paraphrased goals are found below.) Please rate as: 1 = Not at all successful; 2 = Slightly successful; 3 = Moderately successful; 4 = Very successful. Use D/K for "Don't know"

	Success of NCE program	**Success of your network**
Stimulate excellent fundamental and applied research important to Canada's economic development	☐	☐
Develop and retain excellent people in areas important to Canada	☐	☐
Manage multidisciplinary, multisectoral, integrated research programs	☐	☐
Accelerate transfer of results within and outside the network, and use them for economic and social development	☐	☐

28. Are the Phase II NCE goals appropriate for the program as a whole and your network?

	Yes	**No**	**Don't know**
For the program	☐	☐	☐
For your network	☐	☐	☐

Program Alternatives

29. What is your overall degree of satisfaction with the NCE program and your network?

	Very satisfied	**Moderately satisfied**	**Not very satisfied**	**Not at all satisfied**	**Don't Know**
With the NCE program	☐^{1}	☐^{2}	☐^{3}	☐^{4}	☐^{5}
With your network	☐	☐	☐	☐	☐

30. Overall, what are the most significant advantages and disadvantages for you of being in your network?

Advantages:

Disadvantages:

31. Within the current budget of the NCE, is there a better way to achieve the program's goals?

32. If the current total federal budget for university research support remains constant, would you prefer the allocation to the NCE program to change?

☐ I would prefer more research support through the NCE, and correspondingly less through other federal funding sources. How much more to NCE? ☐ %

☐ I would prefer the allocation among programs to remain approximately the same.

☐ I would prefer less research support through the NCE, and correspondingly more through other federal funding sources. How much less to NCE? ☐ %

☐ Don't know

33. Do you have any other comments on the NCE program or your network?

Thank you!

Please return by mail to:
Dennis Rank
The ARA Consulting Group
Suite 350 — 355 Burrard Street
Vancouver B.C. V6C 2G8

OR

Fax back to:
Dennis Rank
(604) 669-7390

If you have any questions, call (604) 681-7577

Survey of NCE Researchers
— New Networks

Any references to the "non-NCE sources" of research support refers to funding through non-NCE programs of the university granting councils, other university grants, provincial research organizations, industry, hospitals, foundations, and so forth. All replies will be kept strictly confidential and results will only be presented in aggregate form. Thank you for your cooperation.

Background

1. Of which network are you a member? ______________________________

2. Are you currently employed primarily by:

   ☐1 A university
   ☐2 A private sector company
   ☐3 A hospital
   ☐4 A government organization
   ☐5 Other. What? ______________________________

3. For how long have you been an active independent researcher? ☐ Years

Impact of the NCE Program on Research

4. On average, roughly what amount of research funding have you been awarded annually? (Provide expected NCE funding figure if it has not yet been finalised.) Only include your portion of jointly-held grants. Do not adjust for inflation. **Please enter "0" if zero.**

In the 5 years prior to joining your network	Since you joined your network	Note: a = b+c
$ ☐	$ ☐	a) Approximate annual average total research funding from all sources.
$ ☐	$ ☐	b) Portion of total that is from your network
$ ☐	$ ☐	c) Portion of total from non-NCE funding sources

5. We are interested in your opinion on the relative impact on your research of various features of your network. Please note the impact on your network research of each of the following, using a scale of -5 to +5, where -5 = Major negative impact; 0 = No impact; and +5 = Major positive impact. Use D/K for "Don't Know".

Impact of the extra research funding you will receive through your network	☐
Impact of your network's networking and collaboration	☐
Impact of your network's management	☐
Impact of interactions with external sources (e.g., industry, government, hospitals)	☐
Impact of your network's support for training highly qualified people	☐

Other impact. What? ______________________________

5b. Of the positive impact — if any — of the network on your research, roughly what percentage will likely be due to the extra research funding, and what percentage will be due to other factors such as networking, management and training? Use D/K for "Don't Know".

☐ Not applicable — impacts are not positive

☐ % Due to extra research funding

☐ % Due to other factors

6. Will your NCE research be different from the type of research you were doing prior to joining the network?

☐ Yes

☐ No

If yes, in what ways will it be different? (Check all that apply.)

☐1 The NCE work is in a new field of research for me, or addressed new topics, or tried new approaches

☐2 The NCE work involves important links to other disciplines

☐3 The NCE work involves important new collaborations

☐4 The NCE work is more oriented towards needs of industry

☐5 The NCE work is more oriented towards needs of government

☐6 The NCE work is more oriented towards health care or social needs

☐7 Other; what? ______________________________

7. How many people work on your research team? The source of funding is irrelevant. Include investigators outside your lab if they are making a significant contribution to your network. Answer in full-time equivalents if appropriate. **Please enter "0" if zero.**

In the 5 years prior to joining your network	**Since joining your network**	
☐	☐	Senior investigators at your university (Including yourself)
☐	☐	Senior investigators at other universities
☐	☐	Senior industry investigators (including yourself, if appropriate)
☐	☐	Senior investigators from organizations such as government and hospitals (including yourself, if appropriate)
☐	☐	Postdoctoral fellows
☐	☐	Graduate students
☐	☐	Other research assistants or associates
☐	☐	Technicians

8. Approximately what proportion of your research has been multidisciplinary in nature? (This could be either through your own work in more than one discipline, or through being part of a multi-disciplinary team.)

In your NCE research	In your non-NCE research	
☐ %	☐ %	Since you joined the network (or is likely once the research program is finalised)
N/A	☐ %	In the same period before you joined the network

If there has been (or likely will be) a change in the degree of multidisciplinarity, what influence has the network had?

	Major influence	Minor influence	No influence	Don't know	Not applicable — no change
For your NCE work	☐^{1}	☐^{2}	☐^{3}	☐^{4}	☐^{5}
For your non-NCE work	☐	☐	☐	☐	☐

9. Is there any difference in terms of the degree of scientific risk of network research projects compared to those supported by non-NCE funding sources (i.e., where "high risk" implies the work is more speculative or the outcome is less certain)?

☐^{1} The network supports relatively more risky, original research than non-NCE sources do

☐^{2} The network supports relatively more conservative, traditional research than non-NCE sources do

☐^{3} There is not much difference in terms of the degree of risk

☐^{4} Don't know

Network Management

10. Do you think your network has set up an effective management system for the following?

	Yes	Partial success	No	Don't know or too soon
Selecting themes that cover the major fields necessary to achieve success in the network's overall goals	☐^{1}	☐^{2}	☐^{3}	☐^{4}
Selecting individual research projects that fit into the network themes	☐	☐	☐	☐
Allocating or changing support to individual projects	☐	☐	☐	☐
Identifying research results with potential for commercial or social benefits	☐	☐	☐	☐
Ensuring partners have the receptor capability to understand and use the research results	☐	☐	☐	☐
Formally or informally tranferring technology to partners and other users	☐	☐	☐	☐
Communicating NCE activities within the network	☐	☐	☐	☐
Communicating NCE activities outside the network	☐	☐	☐	☐

Collaboration and Networking

11. How much collaboration and networking have you had with other parties since joining the network, compared to prior to joining the NCE? Rate as since joining your network you have had: 1 = Much Less; 2 = Less; 3 = About the Same; 4 = More; 5 = Much More. (Partial scores e.g., 3.6 are acceptable. Use D/K for "Don't Know" and N/A for "Not Applicable" if it is too soon to tell.) **Please answer "None" if you have had no such interaction.**

	Helping plan your research	**Helping carry our your research**	**Helping apply your results**
With university researchers	☐	☐	☐
With industry representatives	☐	☐	☐
With government representatives	☐	☐	☐
With hospital or health care representatives	☐	☐	☐

Subsequent Application of Research Results

12. What kind of practical applications are likely from your network research? (Please check all that apply.)

☐1 No practical applications are likely

There will likely be application to:

☐2 Policies or regulations of government agencies
☐3 Policies or regulations of hospitals or other health care organizations (e.g., NGOs)
☐4 Policies or regulations of industry
☐5 Disease/injury diagnosis, treatment, or identification of risk factors
☐6 Social impacts such as improved education, care of the elderly, quality of life, environment
☐7 The R&D topics addressed by private sector companies
☐8 The R&D capability of private sector companies
☐9 Applications for patents, licences, or other intellectual property protection
☐10 Further R&D investments being made by the private sector or the investment community.
☐11 New products, processes, or services being actively developed by or for industry
☐12 New jobs being created, or jobs being retained that would have been lost otherwise
☐13 Other. What? ______________________________

In roughly what time period are these applications likely to occur?

☐1 Some have already occurred
☐2 In the next 5 years
☐3 6-10 years from now
☐4 More than 10 years from now
☐5 Don't Know

If your NCE research has already had any impacts such as those above, please explain:

____

____

____

____

Program Alternatives

13. What is your overall degree of satisfaction with the NCE program and your network so far?

	Very satisfied	Moderately satisfied	Not very satisfied	Not at all satisfied	Too soon to tell
With the NCE program	☐^{1}	☐^{2}	☐^{3}	☐^{4}	☐^{5}
With your network	☐	☐	☐	☐	☐

14. Overall, what are the most significant advantages and disadvantages for you of being in your network?

Advantages:

Disadvantages:

15. Within the current budget of the NCE, is there a better way to achieve the program's goals?

16. If the current total federal budget for university research support remains constant, would you prefer the allocation to the NCE program to change?

☐ I would prefer more research support through the NCE, and correspondingly less through other federal funding sources. How much more to NCE? ☐ %

☐ I would prefer the allocation among programs to remain approximately the same.

☐ I would prefer less research support through the NCE, and correspondingly more through other federal funding sources. How much less to NCE? ☐ %

☐ Don't know

17. Do you have any other comments on the NCE or your network?

Thank you!

Please return by mail to:
Dennis Rank
The ARA Consulting Group
Suite 350 — 355 Burrard Street
Vancouver B.C. V6C 2G8

OR

Fax back to:
Dennis Rank
(604) 669-7390

Survey of NCE Researchers — Non-Renewed Networks

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Background

1. Of which network were you a member? ______________________________
(In questions below, this will be called "your network".)

2. During participation in your network were you employed primarily by:
☐1 A university
☐2 A private sector company
☐3 A hospital
☐4 A government organization
☐5 Other. What? ______________________________

Impact of the NCE Program on Research

3. On average, roughly what amount of research funding have you been awarded annually? Only include your portion of any jointly-held grants. Do not adjust for inflation. **Please enter "0" if zero.**

In the 5 years prior to joining your network	**While you were in the network**	**After your network terminated**	**Note: a = b + c**
$	$	$	a) Approximate total annual average research funding from all sources
$ N/A	$	$	b) Portion of total that was from your network
$	$	$	c) Portion of total from non-NCE funding sources

4. Roughly what has been the proportional split between your fundamental and applied research funding?

	In the 5 years prior to joining your network	**While you were in your network**	**After your network terminated**
Fundamental	%	%	%
Applied	%	%	%

5. If either your average total research funding has changed since the network terminated, or the balance of funding between fundamental and applied research has changed, what influence did the termination of the network have on this change?

	Influence on total funding	**Influence on balance of effort**
Major influence	☐1	☐1
Minor influence	☐2	☐2
No influence	☐3	☐3
Don't know	☐4	☐4
Not applicable (no significant change)	☐5	☐5

6. Was your NCE research different from the type of research you were doing prior to joining the network?

☐ Yes
☐ No

If your NCE research was different from your pre-NCE work, in what ways was it different? (Check all that apply.)

☐[1] Because of NCE, I entered a new field of research, or addressed new topics, or tried new approaches
☐[2] My NCE work involved important links to other disciplines facilitated by the NCE
☐[3] My NCE work involved important new collaborations created through the NCE
☐[4] My NCE work was more oriented towards needs of industry
☐[5] My NCE work was more oriented towards needs of government
☐[6] My NCE work was more oriented towards health care or social needs
☐[7] Other; what? ____________________

7. Which of the following best describes your current research program?

☐[1] It is essentially the same as both my NCE work and the work I was doing prior to joining the network
☐[2] It is essentially the same as my NCE work, but different from the research I did prior to joining the NCE
☐[3] It is essentially the same as the work I did prior to joining the NCE, but different from my NCE research
☐[4] It is different from both my NCE work and the research I did prior to joining the NCE

8. (a) We are interested in your opinion on the relative impact on your research of various features of your network. Please note the impact on your network research of each of the following, using a scale of -5 to +5, where -5 = Major negative impact; 0 = No impact; and +5 = Major positive impact. Use D/K for "Don't Know".

Impact of the extra research funding you received through your network	☐	1
Impact of your network's networking and collaboration	☐	2
Impact of your network's management	☐	3
Impact of your network's interactions with external sources (e.g., industry, government, hospitals)	☐	4
Impact of your network's support for training highly qualified people	☐	5

Other Impact. What? ____________________

8 (b) Of the positive impact — if any — of the network on your research, roughly what percentage is due to the extra research funding, and what percentage is due to other factors such as networking, management, and training? Use D/K for "Don't Know".

☐ Not applicable — impacts are not positive
☐% Due to extra research funding
☐% Due to other factors

9. Did participation in the NCE change your attitude about either collaborative or applied research?

	Collaborative research	**Applied research**
More positive attitude now	☐^{1}	☐^{1}
No change in attitude	☐^{2}	☐^{2}
More negative attitude now	☐^{3}	☐^{3}

If there has been a change in your attitude towards collaborative or applied research, explain:

10. What impact did being in the network have on your **current** research program?

	Increased by NCE	**About the same**	**Decreased by NCE**	**Don't know**
Scientific merit of your current research	☐^{1}	☐^{2}	☐^{3}	☐^{4}
Focus on industrial needs or impacts	☐	☐	☐	☐
Focus on government needs or impacts	☐	☐	☐	☐
Focus on health care needs or impacts	☐	☐	☐	☐
Focus on other social impacts	☐	☐	☐	☐
Focus on training needs or impacts	☐	☐	☐	☐

11. How many people worked on your research project team in the past, and how many people now work on your current research team? (The source of funding is irrelevant. Include investigators outside your lab is they are making a significant contribution to your research.) Answer in full-time equivalents if appropriate. **Please enter "0" if zero.**

Prior to joining your network	**While in your network**	**Your current team**	
			Senior investigators from your university (including yourself, if applicable)
			Senior investigators from other universities
			Senior industry investigators (including yourself, if applicable)
			Senior investigators from organizations such as government or hospitals (including yourself, if applicable)
			Postdoctoral fellows
			Graduate students
			Other research assistants or associates
			Technicians

12. In your present research, to what extent do you maintain the collaborations established while you were in the network?

	More than when in the network	About the same as when in the network	Less than when in the network	No current collaboration
With researchers at your university (if appropriate)	☐^{1}	☐^{2}	☐^{3}	☐^{4}
With researchers at other universities (if appropriate)	☐	☐	☐	☐
With industry	☐	☐	☐	☐
With government	☐	☐	☐	☐
With hospitals or health care agencies	☐	☐	☐	☐
Other. Who? ______________________	☐	☐	☐	☐

13. Approximately what proportion of your research has been multidisciplinary in nature? (This could be either through your own work in more than one discipline, or through being part of a multi-disciplinary team.)

In your NCE research projects	In your non-NCE research projects	
N/A %	☐ %	Prior to joining your network
☐ %	☐ %	While you were in your network
N/A	☐ %	After network terminated

14. If there has been a change in the degree of multidisciplinarity of your work over time, what influence did your network have in this?

☐^{1} Major influence
☐^{2} Minor influence
☐^{3} No influence
☐^{4} Don't know
☐^{5} Not applicable — no change

Impact on Development of Highly Qualified People

15. Did your network affect the type of training provided to younger researchers (i.e., postdoctoral fellows, and graduate students), compared to the training for similar researchers supported through non-NCE sources? Use this scale: 1 = NCE provided poorer training; 2 = NCE training was about the same; 3 = NCE provided better training. Use D/K for "Don't Know", or N/A if your network provided no such training.

Training for postdoctoral fellows	Training for graduate students	Type of Impact
☐	☐	Overall quality of scientific training
☐	☐	Exposure to users in industry, government, health care
☐	☐	Involvement in research project planning and management
☐	☐	Experience with state-of-the-art equipment
☐	☐	Making professional contacts and networking
☐	☐	Impact on prestige and career
☐	☐	Ability to find a job

If NCE training differed from non-NCE training, please explain:

Network Management

16. Did your network have an effective management system for the following purposes?

	Yes	**Partial success**	**No**	**Don't know**
Selecting themes that cover the major fields necessary to achieve success in the network's overall goals	☐^{1}	☐^{2}	☐^{3}	☐^{4}
Selecting individual research projects that fit into the network themes	☐	☐	☐	☐
Allocating or changing support to individual projects	☐	☐	☐	☐
Identifying research results with potential for commercial or social benefits	☐	☐	☐	☐
Ensuring partners have the receptor capability to understand and use the research results	☐	☐	☐	☐
Formally or informally tranferring technology to partners and other users	☐	☐	☐	☐
Communicating NCE activities within the network	☐	☐	☐	☐
Communicating NCE activities outside the network	☐	☐	☐	☐

Please comment:

What were the major impacts, pro and con, of the **network management** for your research while you were in the NCE?

Positive impacts:

Negative impacts:

Subsequent Application of Research Results

17. What kind of practical applications are likely from your network research? Please check all that apply.

- ☐1 No practical applications are likely

There will likely be application to:

- ☐2 Policies or regulations of government agencies
- ☐3 Policies or regulations of hospitals or other health care organizations
- ☐4 Policies or regulations of industry
- ☐5 Disease/injury diagnosis, treatment, or identification of risk factors
- ☐6 Other social impacts (e.g., improved care of the elderly, improvements to quality of life, environmental impacts)
- ☐7 The R&D topics addressed by private sector companies
- ☐8 The R&D capability of private sector companies
- ☐9 Applications for patents, licenses, or other intellectual property protection
- ☐10 Further R&D investments being made by the private sector or the investment community.
- ☐11 New products or services being actively developed by or for industry
- ☐12 New jobs being created, or jobs being retained that would have been otherwise lost
- ☐13 Other. What?____

In roughly what time period are these applications likely to occur?

- ☐1 Some have already occurred
- ☐2 In the next 5 years
- ☐3 6-10 years from now
- ☐4 More than 10 years from now
- ☐5 Don't Know

If your NCE research has already led to impacts such as those above, please explain:

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Impact of Phase II Policies

18. In Phase II of the NCE program, the goals and policies were revised somewhat compared to Phase I. How well informed have you been about these changes?

- ☐1 Very well informed
- ☐2 Moderately well informed
- ☐3 Not very well informed
- ☐4 Not at all informed

What is your understanding of how Phase II differs from Phase I?

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19. Are the Phase II NCE goals appropriate for the program as a whole? Would they have been appropriate for your network if it had been renewed?

	Yes	No	Don't know
For the program	☐	☐	☐
For your network	☐	☐	☐

Program Alternatives

20. What is your overall degree of satisfaction with the NCE program and your network?

	Moderately satisfied	Very satisfied	Not very satisfied	Not at all satisfied	Don't know
With the NCE program	☐^{1}	☐^{2}	☐^{3}	☐^{4}	☐^{5}
With your network	☐	☐	☐	☐	☐

21. Overall, what have been the most lasting advantages and disadvantages of having been in your network?

Advantages:

Disadvantages:

22. Within the current budget of the NCE, is there a better way to achieve the program's goals?

23. Do you have any other comments on the NCE or your network?

Thank you!

Please return by mail to:
Dennis Rank
The ARA Consulting Group
Suite 350 — 355 Burrard Street
Vancouver B.C. V6C 2G8

OR

Fax back to:
Dennis Rank
(604) 669-7390

If you have any questions, call (604) 681-7577

Survey of NCE Partners: General Questions — Renewed Networks

This survey has both general questions about the NCE program and the network you are involved with, and questions about the potential social and/or economic impacts of the research. It may be necessary for different people to answer each type of question — if so, please pass the survey to the appropriate people in your organization. **All replies will be kept strictly confidential by ARA and results will only be presented in aggregate form. The NCE and/or your network will not have access to your individual responses.** Thank you for your cooperation.

Background

1. Of which network are you a partner? ______________________
(In questions below, this is referred to as "the network" or "your network")

2. In case we need to contact you for further details, please give us contact information. **This is for our internal use only.**

Name ______________________

Position ______________________

Organization ______________________

Telephone ______________________

3. Is your organization:

☐ A private sector company
☐ A hospital
☐ A government organization
☐ Other. What? ______________________

4. What is the approximate annual research and development budget (salaries and expenses) of your organization within Canada? **Please enter "0" if zero.**

$ ☐ Total within Canada (including external contracts, network contributions, etc.)

$ ☐ Amount of Canadian total devoted to the general network subject area

$ ☐ Amount of Canadian total that was your most recent annual cash contribution to the network itself

5. Roughly what is your annual Canadian R&D budget as a percentage of your annual Canadian sales revenue? ☐ %

Input into the Network Research Program

6. Is your organization an active participant in any of the following? (Check all that apply)

- ☐1 Network Board of Directors
- ☐2 Network Research Committee
- ☐3 Network Technology transfer, industry liaison, or intellectual property committee
- ☐4 Networking or communications committee
- ☐5 Other. What? ______________________________

7. How much input has your organization had into your network's activities?

	High input	Moderate input	Low input	Don't know
Network board/committee work	☐	☐	☐	☐
Planning the overall network research program or individual projects	☐	☐	☐	☐
Helping carry out some of the network research	☐	☐	☐	☐
Helping review and adjust the network research program	☐	☐	☐	☐
Applying network research results	☐	☐	☐	☐

8. Have you had as much input as you would like?

	Yes	No	Don't know
Network board/committee work	☐	☐	☐
Planning the overall network research program or individual research projects	☐	☐	☐
Helping carry out some of the network research	☐	☐	☐
Helping review and adjust the network research program	☐	☐	☐
Applying the network research results	☐	☐	☐

Please comment:

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Program Issues

9. How satisfied are you with the NCE Phase II program goals and policies?

- ☐1 Highly satisfied
- ☐2 Moderately satisfied
- ☐3 Not very satisfied
- ☐4 Not at all satisfied
- ☐5 Don't know
- ☐6 Don't know what the goals and policies are

10. How have the new Phase II goals and policies affected the following?

	Higher	No change due to revisions	Lower	Don't Know
Your overall satisfaction with NCE program goals and policies	☐	☐	☐	☐
Your satisfaction with your network	☐	☐	☐	☐
Your willingness to join or stay in the network	☐	☐	☐	☐
Your expectations that the network will produce useful results for your organization	☐	☐	☐	☐
Your willingness to contribute in kind to the network	☐	☐	☐	☐
Your willingness to contribute cash to the network	☐	☐	☐	☐
Other. What? ________________________	☐	☐	☐	☐

Please explain:

____

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____

Relevance of Network Research

11. Most networks' overall research programs are sub-divided into research themes/groups, plus individual projects or sub-projects within those themes/groups. How relevant are these elements of your network's research program to your organization?

	High	Medium	Low	Don't know	Not Applicable
The overall network research program	☐	☐	☐	☐	☐
The theme/group(s) your organisation was most involved with	☐	☐	☐	☐	☐
The specific project(s) your organisation was most involved with	☐	☐	☐	☐	☐

12. Does your network have effective management systems for the following purposes?

	Yes	Partially effective	No	Don't know
Managing their research program	☐	☐	☐	☐
Ensuring the research is relevant to partner organizations	☐	☐	☐	☐
Identifying research results with potential for commercial or social benefits	☐	☐	☐	☐
Formally or informally transferring technology to partners and other users	☐	☐	☐	☐
Communicating NCE activities within the network	☐	☐	☐	☐
Communicating NCE activities outside the network	☐	☐	☐	☐

If not, what changes are needed?

____

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13. Does your organization currently have the internal technical capability to use and exploit the network research results in their present form? Has the network had an influence on your technical capability?

	High	Moderate	Low	Don't know
Your organisation's technical capability	☐	☐	☐	☐
The network's influence on your technical capability	☐	☐	☐	☐

Please comment:

____

____

____

Should your network have a role in improving your technical capability?

☐ Yes. How? ____

☐ No. Why? ____

☐ Don't know

14. Please rate the extent to which the network has been useful for your organization to date. Also rate the extent to which it is likely to be useful to you in the future. Please use this scale: 1 = Not at all; 2 = Low; 3 = Moderate; 4 = High; 5 = Very High. Use "D/K" for Don't Know, and "N/A" for Not Applicable.

Usefulness to Date	Likely Usefulness in the Future	**Usefulness as an influence on:**
☐ 1	☐ 13	Policies or regulations of government agencies (yours, if applicable)
☐ 2	☐ 14	Policies or regulations of hospitals or other health care organizations (yours, if applicable)
☐ 3	☐ 15	Policies or regulations of industry (your company, if applicable)
☐ 4	☐ 16	Identifying disease/injury diagnosis, treatment, or identification of risk factors
☐ 5	☐ 17	Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)
☐ 6	☐ 18	The R&D topics addressed by private sector companies (yours, if applicable)
☐ 7	☐ 19	The R&D capability of private sector companies (yours, if applicable)
☐ 8	☐ 20	Applications for patents, licenses, or other intellectual property protection
☐ 9	☐ 21	Further R&D investments being made by the private sector or the investment community (your organization, if applicable)
☐ 10	☐ 22	New products, processes, or services being actively developed by or for industry (your company, if applicable)
☐ 11	☐ 23	New jobs being created, or jobs being retained that would have been lost otherwise. How many jobs in your organization? ☐
☐ 12	☐ 24	Other. What? ________________________________

Please comment:

15. For your organization, do any of the network research results have the potential to lead to significant revenues being earned (or significant costs being saved), relative to the investment you have made?

☐ Yes ☐ No ☐ Don't Know ☐ Not Applicable

If yes, roughly when will this happen?

Some have already occurred	In the next 1 - 5 years	In the next 6 - 10 years	More than 10 years from now	Don't Know
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

If Yes, may we contact you for more detailed information? ☐ Yes ☐ No

16. Do any of the network research results have the potential to lead to significant social impacts, (e.g., improvements to health care, quality of life, or environment) in the foreseeable future?

☐ Yes ☐ No ☐ Don't Know ☐ Not Applicable

If yes, roughly when will this happen?

Some have already occurred	In the next 1 - 5 years	In the next 6 - 10 years	More than 10 years from now	Don't Know
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

If Yes, may we contact you for more detailed information? ☐ Yes ☐ No

17. If the network has not been highly useful to date, and you do not believe it is likely to be highly useful in the future, what factors contribute to its lack of usefulness?

☐ 1 Your organization is not very aware of the results of the network research
☐ 2 You don't have enough technical capability to apply the results
☐ 3 The overall quality of the research was not high
☐ 4 The research is long term, and it is too soon to tell how useful it will be
☐ 5 The research is not in areas relevant to your organization
☐ 6 Other. What? ____________________

18. Were there any network projects that your organization would have carried out anyway if the network did not exist?

☐ No, none of them would have been done without the network

☐ Yes, at least some of the work would have been done anyway
If yes, roughly how much would it have cost you without network assistance? (salaries and expenses)? $

☐ Don't know

If your organization would have carried out some of the research on its own, would there have been a delay?

☐ Yes. If yes, by how long? ☐ years

☐ No

☐ Don't Know

Impact on Training of Highly Qualified People

19. Overall, how important for your organization is the network for access to highly qualified people?

	Very Important	Moderately Important	Not Very Important	Not at all Important	Don't Know
For access to highly skilled university researchers	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
For access to highly trained students you may hire	☐	☐	☐	☐	☐

20. Approximately how many Masters students, Ph.D. graduates and postdoctoral fellows has your organization hired **who were trained in the same research field as the network**, since your organization joined the network? **Please answer "0" if zero, and "D/K" if you don't know.**

Total	Masters	PhD graduates	Postdoctoral Fellows	
☐	☐	☐	☐	Number of new hires who received all or part of their training through your network
☐	☐	☐	☐	Number who received all of their training outside your network

21. Have you seen any difference in the capabilities or knowledge of new hires depending on whether they received part or all of their training through the network?

	Network-trained new hires are better	There is no significant difference	Network-trained new hires are worse	Don't know
Overall technical capability	☐	☐	☐	☐
Knowledge of your organization's needs and priorities	☐	☐	☐	☐

Please comment:

Conclusions

22. How do the benefits of the network to your organization compare to those from "normal" (i.e., non-NCE) university research?

	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Access to relevant, high quality university research and researchers	☐	☐	☐	☐
Access to highly-trained new staff	☐	☐	☐	☐
Technology transfer to your organization	☐	☐	☐	☐
Other. What? ____________________	☐	☐	☐	☐

23. What is your overall degree of satisfaction with the NCE program and your network?

	With the NCE program	With your network
Very satisfied	☐	☐
Moderately satisfied	☐	☐
Not very satisfied	☐	☐
Not at all satisfied	☐	☐

24. Overall, what are the most significant advantages and disadvantages for your organization of being in the network?

Advantages:

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Disadvantages:

____

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____

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25. Within the current budget of the NCE, is there a better way to achieve the program's goals?

26. Is there anything else you would like to add?

Thank You!

Please mail back to: **OR** **Fax back to:**

Dennis Rank
The ARA Consulting Group
350 — 355 Burrard Street
Vancouver, B.C. V6C 2G8

Dennis Rank
(604) 669-7390

If you have any questions call (604) 681-7577

Survey of NCE Partners: General Questions — New Networks

All replies will be kept strictly confidential by ARA and results will only be presented in aggregate form. The NCE and/or your network will not have access to your individual responses. Thank you for your cooperation.

Background

1. Of which network are you a partner? ______________________________
   (In questions below, this is referred to as "the network" or "your network")

2. In case we need to contact you for further details, please give us contact information. **This is for our internal use only.**

   Name ______________________________

   Position ______________________________

   Organization ______________________________

   Telephone ______________________________

3. Is your organization:

   ☐ A private sector company
   ☐ A hospital
   ☐ A government organization
   ☐ Other. What? ______________________________

4. What is the approximate annual research and development budget (salaries and expenses) of your organization within Canada? **Please enter "0" if zero.**

   $ ☐ Total within Canada (including external contracts, network contributions, etc.)

   $ ☐ Portion of Canadian total devoted to the general network subject area

   $ ☐ Portion of the Canadian total that was your most recent annual cash contribution to the network itself

5. Roughly what is your annual Canadian R&D budget as a percentage of your annual Canadian sales revenue? ☐ %

6. Most networks' overall research programs are sub-divided into research themes/groups, plus individual projects or sub-projects within those themes/groups. How relevant are these elements of your network's research program to your organization?

	High	Medium	Low	Don't know	Not Applicable
The overall network research program	☐	☐	☐	☐	☐
The theme/group(s) your organisation is most involved with	☐	☐	☐	☐	☐
The specific project(s) your organisation is most involved with	☐	☐	☐	☐	☐

Input into the Network Research Program

7. Is your organization an active participant in any of the following? (Check all that apply)

☐1 Network Board of Directors
☐2 Network Research Committee
☐3 Network Technology transfer, industry liaison, or intellectual property committee
☐4 Networking or communications committee
☐5 Other. What? ____________________

8. How much input has your organization had into your network's activities?

	High input	Moderate input	Low input	Don't know
Network board/committee work	☐	☐	☐	☐
Planning the overall network research program or individual projects	☐	☐	☐	☐
Helping carry out some of the network research	☐	☐	☐	☐
Helping review and adjust the network research program	☐	☐	☐	☐
Applying network research results	☐	☐	☐	☐

9. Have you had as much input as you would like?

	Yes	No	Don't know
Network board/committee work	☐	☐	☐
Planning the overall network research program or individual research projects	☐	☐	☐
Helping carry out some of the network research	☐	☐	☐
Helping review and adjust the network research program	☐	☐	☐
Applying the network research results	☐	☐	☐

Please comment:

Program Issues

10. How satisfied are you with the NCE Phase II program goals and policies?

☐1 Highly satisfied
☐2 Moderately satisfied
☐3 Not very satisfied
☐4 Not at all satisfied
☐5 Don't know
☐6 Don't know what the goals and policies are

11. Does your network have effective management systems for the following purposes?

	Yes	Partially effective	No	Don't know
Managing their research program	☐	☐	☐	☐
Ensuring the research is relevant to partner organizations	☐	☐	☐	☐
Identifying research results with potential for commercial or social benefits	☐	☐	☐	☐
Formally or informally transferring technology to partners and other users	☐	☐	☐	☐
Communicating NCE activities within the network	☐	☐	☐	☐
Communicating NCE activities outside the network	☐	☐	☐	☐

If not, what changes are needed?

12. Does your organization currently have the internal technical capability to use and exploit the network research results in their present form? Has the network had an influence on your technical capability?

	High	Moderate	Low	Don't know
Your organisation's technical capability	☐	☐	☐	☐
The network's influence on your technical capability	☐	☐	☐	☐

Please comment:

Should your network have a role in improving your technical capability?

☐ Yes. How? ______

☐ No. Why? ______

☐ Don't know

13. Please rate the extent to which the network is likely to be useful to your organization in the future. Please use this scale: 1 = Not at all; 2 = Low; 3 = Moderate; 4 = High; 5 = Very High. Use "D/K" for Don't Know, and "N/A" for Not Applicable.

Likely Usefulness in the Future		Usefulness as an influence on:
☐	1	Policies or regulations of government agencies (yours, if applicable)
☐	2	Policies or regulations of hospitals or other health care organizations (yours, if applicable)
☐	3	Policies or regulations of industry (your company, if applicable)
☐	4	Identifying disease/injury diagnosis, treatment, or identification of risk factors

☐ 5 Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)

☐ 6 The R&D topics addressed by private sector companies (yours, if applicable)

☐ 7 The R&D capability of private sector companies (yours, if applicable)

☐ 8 Applications for patents, licenses, or other intellectual property protection

☐ 9 Further R&D investments being made by the private sector or the investment community (your organization, if applicable)

☐ 10 New products, processes, or services being actively developed by or for industry (your company, if applicable)

☐ 11 New jobs being created, or jobs being retained that would have been lost otherwise.

☐ 12 Other. What? ____

14. Are there any network projects that your organization would have carried out anyway if the network did not exist?

☐ No, none of them would have been done without the network

☐ Yes, at least some of the work would have been done anyway

If yes, roughly how much would it have cost you without network assistance? (salaries and expenses)? $ __________

☐ Don't know

15. How do the expected benefits of the network to your organization compare to those from "normal" (i.e., non-NCE) university research?

	The network provides fewer benefits	The network and other university research provide essentially similar benefits	The network provides more benefits	Don't know
Access to relevant, high quality university research and researchers	☐	☐	☐	☐
Access to highly-trained new staff	☐	☐	☐	☐
Technology transfer to your organization	☐	☐	☐	☐
Other. What? ____________	☐	☐	☐	☐

16. What is your overall degree of satisfaction with the NCE program and your network so far?

	With the NCE program	With your network
Very satisfied	☐	☐
Moderately satisfied	☐	☐
Not very satisfied	☐	☐
Not at all satisfied	☐	☐

17. Overall, what are the most significant advantages and disadvantages for your organization of being in the network?

Advantages:

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Disadvantages:

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18. Within the current budget of the NCE, is there a better way to achieve the program's goals?

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19. Is there anything else you would like to add?

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Thank You!

Please mail back to: **OR** **Fax back to:**

Dennis Rank
The ARA Consulting Group
350 — 355 Burrard Street
Vancouver, B.C. V6C 2G8

Dennis Rank
(604) 669-7390

If you have any questions call (604) 681-7577

Survey of NCE Partners: General Questions — Non-Renewed Networks

This survey has both general questions about the NCE program and the network you were involved with, and questions about the potential *social and/or economic* impacts of the research. It may be necessary for different people to answer each type of question — if so, please pass the survey to the appropriate people in your organization. **All replies will be kept strictly confidential by ARA and results will only be presented in aggregate form. The NCE and/or your network will not have access to your individual responses.** Thank you for your cooperation.

Background

1. Of which network were you a partner? ____________________
(In questions below, this is referred to as "the network" or "your network")

2. In case we need to contact you for further details, please give us contact information. **This is for our internal use only.**

Name ____________________

Position ____________________

Organization ____________________

Telephone ____________________

3. Is your organization:

☐ A private sector company
☐ A hospital
☐ A government organization
☐ Other. What? ____________________

4. What is the approximate annual research and development budget (salaries and expenses) of your organization within Canada? **Please enter "0" if zero.**

$ ☐	Total within Canada (including external contracts, network contributions, etc.)
$ ☐	Amount of Canadian total devoted to the general network subject area
$ ☐	Amount of Canadian total that was your most recent annual cash contribution to the network itself

5. Roughly what is your annual Canadian R&D budget as a percentage of your annual Canadian sales revenue? ☐ %

Input into the Network Research Program

6. Most networks' overall research programs were sub-divided into research themes/groups, plus individual projects or sub-projects within those themes/groups. How relevant were these elements of your network's research program to your organization?

	High	Medium	Low	Don't know	Not Applicable
The overall network research program	☐	☐	☐	☐	☐
The theme/group(s) your organisation is most involved with	☐	☐	☐	☐	☐
The specific project(s) your organisation is most involved with	☐	☐	☐	☐	☐

7. Was your organization an active participant in any of the following? (Check all that apply)

☐1 Network Board of Directors
☐2 Network Research Committee
☐3 Network Technology transfer, industry liaison, or intellectual property committee
☐4 Networking or communications committee
☐5 Other. What? ____________________

8. How much input did your organization have into your network's activities?

	High input	Moderate input	Low input	Don't know
Network board/committee work	☐	☐	☐	☐
Planning the overall network research program or individual projects	☐	☐	☐	☐
Helping carry out some of the network research	☐	☐	☐	☐
Helping review and adjust the network research program	☐	☐	☐	☐
Applying network research results	☐	☐	☐	☐

9. Did you have as much input as you would like?

	Yes	No	Don't know
Network board/committee work	☐	☐	☐
Planning the overall network research program or individual research projects	☐	☐	☐
Helping carry out some of the network research	☐	☐	☐
Helping review and adjust the network research program	☐	☐	☐
Applying the network research results	☐	☐	☐

Please comment:

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Technology Transfer and Research Usefulness

10. Please rate the extent to which the network was useful for your organization during its existence. If there are likely to be any impacts which will occur after the network terminated, also rate the future usefulness of these impacts. Please use this scale:
1 = Not at all; 2 = Low; 3 = Moderate; 4 = High; 5 = Very High. Use "D/K" for Don't Know, and "N/A" for Not Applicable.

Usefulness During Network's Existence	Likely Usefulness in the Future	Usefulness as an influence on:
☐ 1	☐ 13	Policies or regulations of government agencies (yours, if applicable)
☐ 2	☐ 14	Policies or regulations of hospitals or other health care organizations (yours, if applicable)
☐ 3	☐ 15	Policies or regulations of industry (your company, if applicable)
☐ 4	☐ 16	Identifying disease/injury diagnosis, treatment, or identification of risk factors
☐ 5	☐ 17	Providing social benefits (e.g., improved education, improved care of the elderly, improvements to quality of life, environmental improvements)
☐ 6	☐ 18	The R&D topics addressed by private sector companies (yours, if applicable)
☐ 7	☐ 19	The R&D capability of private sector companies (yours, if applicable)
☐ 8	☐ 20	Applications for patents, licenses, or other intellectual property protection
☐ 9	☐ 21	Further R&D investments being made by the private sector or the investment community (your organization, if applicable)
☐ 10	☐ 22	New products, processes, or services being actively developed by or for industry (your company, if applicable)
☐ 11	☐ 23	New jobs being created, or jobs being retained that would have been lost otherwise. How many jobs in your organization? ☐
☐ 12	☐ 24	Other. What? ______________________

Please comment:

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11. Did your network have effective management systems for the following purposes?

	Yes	Partially effective	No	Don't know
Managing their research program	☐	☐	☐	☐
Ensuring the research was relevant to partner organizations	☐	☐	☐	☐
Identifying research results with potential for commercial or social benefits	☐	☐	☐	☐
Formally or informally transferring technology to partners and other users	☐	☐	☐	☐
Communicating NCE activities within the network	☐	☐	☐	☐
Communicating NCE activities outside the network	☐	☐	☐	☐

12. Did your organization have the internal technical capability to use and exploit the network research results? Did the network have an influence on your technical capability?

	High	Moderate	Low	Don't know
Your organisation's technical capability	☐	☐	☐	☐
The network's influence on your technical capability	☐	☐	☐	☐

Please comment:

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Should your network have had a role in improving your technical capability?

☐ Yes. How? ____

☐ No. Why? ____

☐ Don't know

13. For your organization, did any of the network research results have the potential to lead to significant revenues being earned (or significant costs being saved), relative to the investment you made?

☐ Yes ☐ No ☐ Don't Know ☐ Not Applicable

If yes, roughly when will this happen?

Some have already occurred	In the next 1 - 5 years	In the next 6 - 10 years	More than 10 years from now	Don't Know
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

If Yes, may we contact you for more detailed information? ☐ Yes ☐ No

14. Did any of the network research results have the potential to lead to significant social impacts, (e.g., improvements to health care, quality of life, or environment) in the foreseeable future?

☐ Yes ☐ No ☐ Don't Know ☐ Not Applicable

If yes, roughly when will this happen?

Some have already occurred	In the next 1 - 5 years	In the next 6 - 10 years	More than 10 years from now	Don't Know
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

If Yes, may we contact you for more detailed information? ☐ Yes ☐ No

15. If the network was not highly useful during its existence, and you do not believe that any impacts lasting after it terminated are likely to be highly useful in the future, what factors contribute to its lack of usefulness?

☐$_1$ Your organization was not very aware of the results of the network research
☐$_2$ You didn't have the technical capability to apply the results
☐$_3$ The overall quality of the research was not high
☐$_4$ The projects were long term, and it is too soon to tell how useful they will be
☐$_5$ The research was not in areas relevant to your organization
☐$_6$ Since the network was not renewed for Phase II there is no longer a means of applying the research results
☐$_7$ Other. What? ____

16. Were there any network projects that your organization would have carried out anyway if the network did not exist?

☐ No, none of them would have been done without the network

☐ Yes, at least some of the work would have been done anyway

If yes, roughly how much would it have cost you without network assistance? (salaries and expenses)? $ ☐

☐ Don't know

If your organization would have carried out some of the research on its own, would there have been a delay?

☐ Yes. If yes, by how long? ☐ years

☐ No

☐ Don't Know

Impact on Training of Highly Qualified People

17. Overall, how important for your organization was the network for access to highly qualified people?

	Very Important	Moderately Important	Not Very Important	Not at all Important	Don't Know
For access to highly skilled university researchers	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
For access to highly trained students you may hire	☐	☐	☐	☐	☐

18. Approximately how many Masters students, Ph.D. graduates and postdoctoral fellows did your organization hire **who were trained in the same research field as the network**, since your organization joined the network? **Please answer "0" if zero, and "D/K" if you don't know.**

Total	Masters	PhD graduates	Postdoctoral Fellows	
☐	☐	☐	☐	Number of new hires who received all or part of their training through your network
☐	☐	☐	☐	Number who received all of their training outside your network

19. Have you seen any difference in the capabilities or knowledge of new hires depending on whether they received part or all of their training through the network?

	Network-trained new hires are better	There is no significant difference	Network-trained new hires are worse	Don't know
Overall technical capability	☐	☐	☐	☐
Knowledge of your organization's needs and priorities	☐	☐	☐	☐

Please comment:

Conclusions

20. How did the benefits of the network to your organization compare to those from "normal" (i.e., non-NCE) university research?

	The network provided fewer benefits	The network and other university research provided essentially similar benefits	The network provided more benefits	Don't know
Access to relevant, high quality university research and researchers	☐	☐	☐	☐
Access to highly-trained new staff	☐	☐	☐	☐
Technology transfer to your organization	☐	☐	☐	☐
Other. What? ____________________	☐	☐	☐	☐

21. What was your overall degree of satisfaction with the NCE program and your network?

	With the NCE program	With your network
Very satisfied	☐	☐
Moderately satisfied	☐	☐
Not very satisfied	☐	☐
Not at all satisfied	☐	☐

22. Overall, what were the most significant advantages and disadvantages for your organization of being in the network?

Advantages:

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Disadvantages:

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23. Within the current budget of the NCE, is there a better way to achieve the program's goals?

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24. Is there anything else you would like to add?

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Thank You!

Please mail back to: **OR** **Fax back to:**

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Vancouver, B.C. V6C 2G8

Dennis Rank
(604) 669-7390

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Sondage auprès des chercheurs des RCE
— Réseaux renouvelés

Toute référence aux sources autres que le RCE réfère au financement en vertu des programmes comme ceux des conseils subventionnaires, des universités, des organismes provinciaux, de l'industrie, des hôpitaux, des fondations, ainsi de suite. Toutes les réponses demeureront confidentielles et les résultats seront présentés de façon globale. Merci de votre collaboration.

Renseignements généraux

1. De quel réseau faites-vous partie? ________________________________
(Ce réseau sera appelé « le réseau ou le RCE » dans ce questionnaire)

2. Votre employeur principal est :

☐ 1 une université
☐ 2 une société privée
☐ 3 un hôpital
☐ 4 un organisme gouvernemental
☐ 5 autre, précisez ________________________________

3. Depuis combien temps êtes-vous un(e) chercheur(e) autonome actif(ve)? ☐ Années

Impact du Programme RCE sur la recherche

4. En gros, combien d'argent par année, en moyenne, recevez-vous pour votre recherche depuis que vous participez au réseau? N'incluez que votre part des subventions conjointes. Ne tenez pas compte de l'inflation. **Inscrivez « 0 » si la réponse est zéro.**

Dans les 5 années précédant votre participation au réseau	**Depuis que vous êtes membre du réseau**	**Note : a = b+c**
☐ $	☐ $	a) Montant annuel moyen approximatif (toutes sources)
☐ $	☐ $	b) Portion du total qui vient du RCE
☐ $	☐ $	c) Portion d'autres sources que le RCE

5. En gros, quelle proportion du financement de votre recherche va à la recherche fondamentale et à la recherche appliquée?

	Dans les 5 années précédant votre participation au réseau	**Depuis que vous êtes membre du réseau**
Fondamentale	☐ %	☐ %
Appliquée	☐ %	☐ %

6. Si votre financement annuel total a changé depuis que vous faites partie du réseau ou si l'équilibre fondamental/appliqué a changé, jusqu'à quel point votre participation au réseau est-elle responsable de ces changements?

	Grande influence	**Faible influence**	**Aucune influence**	**Je ne sais pas**	**Sans objet (peu ou pas de changement)**
Influence sur le financement total	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Influence sur l'équilibre fondamental/appliqué	☐	☐	☐	☐	☐

7. (a) Nous sommes intéressés par votre opinion de l'impact sur votre recherche de certaines des caractéristiques de votre réseau. Pour chacun des éléments énoncés ci-dessous, veuillez indiquer l'impact du réseau sur votre recherche en utilisant une échelle de -5 à +5, où -5 = un impact négatif important; 0 = aucun impact; et +5 = impact positif important. Inscrivez NSP si vous ne savez pas.

Impact du financement additionnel que vous avez reçu du réseau ☐

Impact du maillage et de la collaboration ☐

Impact de la gestion du réseau ☐

Impact des interactions avec des sources externes (p.ex. industrie, gouvernements, hôpitaux) ☐

Impact de l'appui du réseau à la formation de personnes hautement qualifiées ☐

Impact d'autres éléments (précisez)?________________________________ ☐

7. (b) Quelle proportion des impacts positifs du réseau, s'il y en a eu, est-elle attribuable au simple fait d'avoir obtenu un financement additionnel plutôt qu'à d'autres facteurs comme le maillage, la gestion ou la formation? Inscrivez « ne sais pas » si vous ne le savez pas.

☐ Sans objet — les impacts ne sont pas positifs

☐ % Attribuable au financement additionnel de la recherche

☐ % Attribuable à d'autres facteurs

8. **Votre recherche RCE** est-elle différente du type de recherche que vous faisiez avant de vous joindre au réseau?

☐ Oui ☐ Non

Si oui, comment est-elle différente? (Cochez toutes les cases pertinentes.)

☐1 Le travail RCE est dans un nouveau domaine de recherche pour moi, porte sur de nouveaux sujets ou fait appel à de nouvelles méthodes

☐2 Le travail RCE comporte des liens importants avec d'autres disciplines

☐3 Le travail RCE comprend de nouvelles collaborations importantes

☐4 Le travail RCE est plus orienté vers les besoins industriels

☐5 Le travail RCE est plus orienté vers les besoins gouvernementaux

☐6 Le travail RCE est plus orienté vers les soins de santé et les besoins sociaux

☐7 Autre, précisez ____

9. Votre participation au réseau a-t-elle influencé votre programme général de recherche (c-à-d. la partie de votre travail qui n'est pas financée par le RCE)?

☐ Oui ☐ Non ☐ Sans objet (tout mon travail est dans le cadre du réseau)

Si oui, comment a-t-elle changé? (Cochez toutes les cases pertinentes.)

☐1 Grâce au RCE, mes autres travaux sont dans un nouveau domaine de recherche, portent sur de nouveaux sujets ou font appel à de nouvelles méthodes

☐2 Mes autres travaux comportent des liens importants avec d'autres disciplines, et ces liens ont été facilités par le réseau

☐3 Mes autres travaux comprennent de nouvelles collaborations importantes crées grâce au réseau

☐4 Mes autres travaux sont plus orientés vers les besoins industriels à cause du réseau

☐5 Mes autres travaux sont plus orientés vers les besoins gouvernementaux à cause du réseau

☐6 Mes autres travaux sont plus orientés vers les soins de santé et les besoins sociaux, à cause du réseau

☐7 Autre, précisez ____

10. Le RCE a-t-il changé votre attitude face à la collaboration ou à la recherche appliquée?

	Mon attitude est plus positive maintenant	**Mon attitude n'a pas changé**	**Mon attitude est plus négative maintenant**
Face à la collaboration	☐	☐	☐
Face à la recherche appliquée	☐	☐	☐

S'il y a eu changement d'attitude, veuillez donner des explications :

____

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11. Combien de personnes votre équipe de recherche compte-t-elle, sans égard à la source de fonds? Comptez les chercheurs de l'extérieur de votre laboratoire si leurs contributions à votre réseau sont importantes. Répondez en équivalent plein temps s'il y a lieu. **Inscrivez 0 si la réponse est zéro.**

Dans les 5 années précédant votre participation au réseau	**Depuis que vous êtes membre du réseau**	
☐	☐	Chercheurs chevronnés à votre université (y compris vous-même)
☐	☐	Chercheurs chevronnés à d'autres universités
☐	☐	Chercheurs industriels chevronnés (y compris vous-même)
☐	☐	Chercheurs chevronnés d'autres organismes, comme les gouvernements ou les hôpitaux (y compris vous-même
☐	☐	Boursiers postdoctoraux
☐	☐	Étudiants aux cycles supérieurs
☐	☐	Autres assistants ou associés de recherche
☐	☐	Techniciens

12. Approximativement, quelle proportion de votre recherche est-elle multidisciplinaire? (Soit parce que vous travaillez dans plus d'une discipline ou parce que vous faites partie d'une équipe multidisciplinaire).

Votre recherche RCE	**Votre autre recherche**	
☐ %	☐ %	Depuis que vous faites partie du réseau
s/o	☐ %	Pendant la même période avant que vous ne deveniez membre du réseau

S'il y a eu changement, quelle a été l'influence du réseau?

	Grande influence	**Faible influence**	**Pas d'influence**	**Je ne sais pas**	**Ne s'applique pas - pas de changement**
Sur votre travail RCE	☐1	☐2	☐3	☐4	☐5
Sur vos autres travaux	☐	☐	☐	☐	☐

13. Nous voulons savoir si votre recherche est plus valable scientifiquement selon qu'elle est appuyée par le RCE ou par d'autres sources. Selon vous, en gros, quelle proportion de votre recherche tombe-t-elle dans les catégories suivantes?

	Exceptionnelle	Excellente	Bonne	Acceptable	Faible	TOTAL
Votre recherche RCE	%	%	%	%	%	100%
Votre autre recherche	%	%	%	%	%	100%

Si la valeur scientifique de votre recherche est différente, veuillez donner des explications :

14. Votre recherche RCE et votre autre recherche sont-elles différentes en ce qui concerne le niveau de risque? (Risque élevé réfère à un travail plus spéculatif, dont les résultats sont moins prévisibles.)

☐1 Le réseau appuie généralement de la recherche dont le risque est plus élevé

☐2 Le réseau appuie généralement de la recherche plus conservatrice, plus traditionnelle

☐3 Il n'y a pas vraiment de différences entre la recherche RCE et l'autre recherche

☐4 Je ne sais pas

Impact sur la formation de personnel hautement qualifié

15. Depuis 1989, avez-vous laissé un poste dans un autre pays pour accepter un poste au Canada?

☐ Oui ☐ Non

Si ou, quelle a été le rôle du réseau dans votre décision de venir au Canada?

☐1 Très important

☐2 Assez important

☐3 Peu important

☐4 Aucune importance

☐5 Je ne sais pas

16. Depuis 1989 (ou depuis votre déménagement au Canada s'il y a lieu), avez-vous songé sérieusement à accepter un poste de recherche à l'extérieur du Canada?

☐ Oui ☐ Non

Si oui, quel a été le rôle du réseau dans votre décision de demeurer au Canada?

☐1 Très important

☐2 Assez important

☐3 Peu important

☐4 Aucune importance

☐5 Je ne sais pas

17. La formation des jeunes chercheurs (c-à-d. stagiaires postdoctoraux, étudiants aux cycles supérieurs) au sein du réseau diffère-t-elle de la formation offerte dans le cadre de recherche appuyée par d'autres sources? Utilisez cette échelle : I=la formation RCE est moins bonne; 2=la formation RCE est à peu près équivalente; 3 = la formation RCE est meilleure. Utilisez NSP si vous ne savez pas ou s/o si votre réseau n'offre pas ce genre de formation.

Formation des stagiaires postdoctoraux	**Formation des étudiants aux cycles supérieurs**	**Type of Impact**
☐	☐	Qualité d'ensemble de la formation scientifique
☐	☐	Exposition aux utilisateurs de l'industrie, des gouvernements, des soins de santé
☐	☐	Participation à la planification et à la gestion des projets de recherche
☐	☐	Expérience avec de l'équipement de pointe
☐	☐	Contacts professionnels et maillage
☐	☐	Impact sur le prestige et la carrière
☐	☐	Facilité à trouver un emploi

S'il y a une différence, veuillez donner des explications :

Gestion du réseau

18. Votre réseau a-t-il un système efficace de gestion pour les éléments suivants :

	Oui	**Succès partiel**	**Non**	**Ne sais pas**
Choix de thèmes qui englobent les grands domaines nécessaires pour atteindre les objectifs d'ensemble du réseau	☐1	☐2	☐3	☐4
Choix de projets de recherche qui s'insèrent dans les thèmes du réseau	☐	☐	☐	☐
Affectation ou modification des budgets des divers projets	☐	☐	☐	☐
Identification des résultats de recherche susceptibles d'avoir des retombées commerciales ou sociales	☐	☐	☐	☐
Communication des activités du RCE à l'intérieur du réseau	☐	☐	☐	☐
Communication des activités RCE à l'extérieur du réseau	☐	☐	☐	☐

Commentaires :

19. Décrivez les principaux impacts (positifs et négatifs) de la **gestion du réseau** sur votre recherche :

Impacts positifs :

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____

Impacts négatifs :

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Collaboration et maillage

20. Décrivez les collaborations et le maillage depuis que vous faites partie du réseau, comparativement à ce que vous faisiez auparavant. Utilisez cette échelle : 1 = beaucoup moins depuis le RCE; 2 = moins; 3 = comparable; 4 = plus; 5 = beaucoup plus. (Des cotes fractionnaires, p.ex. 3,6, sont acceptables. Utilisez « NSP » pour « Je ne sais pas » et « s/o » pour « sans objet ».) **Répondez « Aucune » si vous n'avez pas eu d'interaction.**

	Pour aider à planifier votre recherche	**Pour aider à effectuer votre recherche**	**Pour aider à appliquer vos résultats**
Avec des chercheurs universitaires	☐	☐	☐
Avec des représentants industriels	☐	☐	☐
Avec des représentants gouvernementaux	☐	☐	☐
Avec des représentants des hôpitaux ou des services de soins de santé	☐	☐	☐

21. Depuis que vous faites partie du réseau, collaborez-vous davantage ou moins? Tenez compte des collaborations avec des personnes de l'extérieur du réseau si ces collaborations sont pertinentes à votre recherche RCE.

	Je collabore moins	**Comparable**	**Je collabore davantage**	**Je ne sais pas**
Avec des chercheurs universitaires	☐1	☐2	☐3	☐4
Avec l'industrie	☐	☐	☐	☐
Avec les gouvernements	☐	☐	☐	☐
Avec les représentants des hôpitaux ou des services de soins de santé	☐	☐	☐	☐
Avec d'autres; précisez________________	☐	☐	☐	☐

22. Dans votre milieu actuel de recherche, la mesure dans laquelle vous collaborez dépend probablement de plusieurs facteurs. Quelle a été l'influence du RCE, par rapport à d'autres facteurs, sur la quantité de collaborations ou d'activités de maillage que vous avez récemment entreprises?

☐1 Le RCE a été le facteur le plus important
☐2 Le RCE et d'autres facteurs sont d'importance équivalente
☐3 D'autres facteurs ont été plus importants que le RCE. Lesquels? ____________________
☐4 Sans objet : le niveau de collaboration et de maillage n'a pas changé.
☐5 Je ne sais pas

23. Quels ont été les principaux impacts, positifs et négatifs, de la collaboration RCE sur votre recherche?

Impacts positifs :

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Impacts négatifs :

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____
____

Application subséquente des résultats de la recherche

24. Selon vous, quel genre d'applications pratiques devraient-elles découler de votre réseau? Veuillez cocher toutes les cases pertinentes.

☐1 Applications improbables

Il y aura probablement des applications qui porteront sur :

☐2 Les politiques ou règlements d'organismes gouvernementaux
☐3 Les politiques ou règlements d'hôpitaux ou d'autres organismes de soins de santé (p.ex., ONG)
☐4 Les politiques ou règlements de l'industrie
☐5 Le diagnostic/traitement de maladies ou blessures ou identification de facteurs de risque
☐6 D'autres impacts sociaux (p.ex., meilleure éducation, meilleurs soins de santé pour les aînés, amélioration de la qualité de vie, impact sur l'environnement)
☐7 Les sujets de R et D abordés par l'entreprise privée
☐8 Les compétences de R et D de l'entreprise privée
☐9 Les demandes de brevets, licences, ou autres formes de protection de la propriété intellectuelle
☐10 D'autres investissements en R et D de la part du secteur privé et d'investisseurs
☐11 De nouveaux produits, procédés ou services développés par ou pour l'industrie
☐12 La création de nouveaux emplois, ou la rétention d'emplois qui aurait été perdus
☐13 Autres, précisez ____________________

Dans combien de temps environ ces applications auront-elles lieu?

- ☐1 Certaines ont déjà eu lieu
- ☐2 D'ici 5 ans
- ☐3 D'ici 6 à 10 ans
- ☐4 Dans plus de 10 ans
- ☐5 Je ne sais pas

Si votre recherche RCE a déjà eu des impacts de ce genre, veuillez fournir des explications :

Impact des politiques de la phase II

25. Dans la phase II du Programme RCE, les buts et les politiques ont été quelque peu modifiés par rapport à la phase I. Jusqu'à quel point êtes-vous informé(e) de ces changements?

- ☐1 Je suis très bien informé(e)
- ☐2 Je suis assez bien informé(e)
- ☐3 Je ne suis pas très bien informé(e)
- ☐4 Je ne suis pas informé(e) du tout.

Selon vous, quelles sont les différences entre la phase I et la phase II?

26. De quelle façon les nouveaux buts et politiques de la phase II ont-ils affecté les éléments suivants :

	Plus élevé(e)	**Pas de changement**	**Moindre**	**Je ne sais pas**
Votre niveau de satisfaction des buts et politiques du Programme RCE	☐1	☐2	☐3	☐4
Votre niveau de satisfaction des buts et politiques de votre réseau	☐	☐	☐	☐
Votre volonté de demeurer au sein du réseau	☐	☐	☐	☐
La proportion de votre recherche totale consacrée à la science fondamentale à long terme	☐	☐	☐	☐
La proportion de votre recherche consacrée à la recherche d'intérêt pour l'industrie, les gouvernements, ou les services de soins de santé	☐	☐	☐	☐
Autre, précisez ________________	☐	☐	☐	☐

27. Selon vous, jusqu'à quel point le Programme RCE et votre réseau atteignent-ils les buts de la phase II? (Les énoncés ci-dessous sont une paraphrase des buts.) Veuillez utiliser l'échelle suivante : 1 = aucun succès; 2 = succès mitigé; 3 = succès raisonnable; 4 = grand succès. Utilisez NSP si vous ne savez pas.

	Succès du programme RCE	Succès de votre réseau
Stimuler de l'excellente recherche fondamentale et appliquée, importante pour le développement économique du Canada	☐	☐
Former et retenir d'excellentes compétences dans des domaines importants pour le Canada	☐	☐
Gérer des programmes de recherche intégrés, multidisciplinaires et multisectoriels	☐	☐
Accélérer le transfert de résultats à l'intérieur et à l'extérieur du réseau, et les utiliser pour le développement économique et social.	☐	☐

28. Les buts de la phase II sont-ils appropriés pour le programme dans son ensemble et pour votre réseau?

	Oui	Non	Je ne sais pas
Pour le programme	☐	☐	☐
Pour votre réseau	☐	☐	☐

Solutions de rechange au Programme

29. Dans l'ensemble, êtes-vous satisfait(e) du Programme RCE et de votre réseau?

	Très satisfait(e)	Assez satisfait(e)	Pas très satisfait(e)	Pas du tout satisfait(e)	Je ne sais pas
Du Programme RCE	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
De votre réseau	☐	☐	☐	☐	☐

30. Dans l'ensemble, quels sont les principaux avantages et désavantages de votre participation au réseau?

Avantages :

Désavantages :

31. Dans les limites du budget actuel du Programme RCE, y aurait-il, selon vous, une meilleure façon d'atteindre les buts du Programme?

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32. Si le budget fédéral total d'aide à la recherche universitaire demeurait constant, quelle serait votre préférence pour ce qui est du Programme RCE?

☐ Je préférerais voir augmenter le Programme RCE, et donc diminuer les autres sources fédérales d'un montant équivalent. De combien augmenteriez vous les RCE? ☐ %

☐ Je préférerais que le répartition des fonds entre les programmes ne change pas

☐ Je préférerais voir diminuer le Programme RCE, et donc augmenter les autres sources d'un montant équivalent. De combien diminueriez-vous les RCE? ☐ %

☐ Je ne sais pas

33. Avez-vous d'autres commentaires sur le Programme RCE ou sur votre réseau?

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Merci!

Veuillez retourner le questionnaire par la poste à :

Dennis Rank
The ARA Consulting Group
Suite 350 — 355 Burrard Street
Vancouver B.C. V6C 2G8

ou par télécopieur, à :

Dennis Rank
(604) 669-7390

Si vous avez des questions, veuillez composer le (604) 681-7577

Sondage auprès des chercheurs des RCE — Nouveaux réseaux

Toute référence aux sources autres que le RCE réfère au financement en vertu des programmes comme ceux des conseils subventionnaires, des universités, des organismes provinciaux, de l'industrie, des hôpitaux, des fondations, ainsi de suite. Toutes les réponses demeureront confidentielles et les résultats seront présentés de façon globale. Merci de votre collaboration.

Renseignements généraux

1. De quel réseau faites-vous partie? ____________________
(Ce réseau sera appelé «le réseau ou le RCE » dans ce questionnaire)

2. Votre employeur principal est :

☐1 une université
☐2 une société privée
☐3 un hôpital
☐4 un organisme gouvernemental
☐5 autre, précisez ____________________

3. Depuis combien temps êtes-vous un(e) chercheur(e) autonome actif(ve)? ☐ Années

Impact du Programme RCE sur la recherche

4. En gros, combien d'argent par année, en moyenne, recevez-vous pour votre recherche (Inscrivez les montants attendus du RCE si ce financement n'est pas encore définitif). N'incluez que votre part des subventions conjointes. Ne tenez pas compte de l'inflation. **Inscrivez « 0 » si la réponse est zéro.**

Dans les 5 années précédant votre participation au réseau	Depuis que vous êtes membre du réseau	Note : a = b+c
☐ $	☐ $	a) Montant annuel moyen approximatif (toutes sources)
☐ $	☐ $	b) Portion du total qui vient du RCE
☐ $	☐ $	c) Portion d'autres sources que le RCE

5. Nous sommes intéressés par votre opinion de l'impact sur votre recherche de certaines des caractéristiques de votre réseau. Pour chacun des éléments ci-dessous, indiquez l'impact du réseau sur votre recherche en utilisant une échelle de -5 à +5, où -5 = impact négatif important; 0 = aucun impact; et +5 = impact positif important. Inscrivez NSP si vous ne savez pas.

Impact du financement additionnel du réseau	☐
Impact du maillage et de la collaboration	☐
Impact de la gestion du réseau	☐
Impact des interactions avec des sources externes (p.ex. industrie, gouvernements, hôpitaux)	☐
Impact de l'appui du réseau à la formation de personnes hautement qualifiées	☐
Impact d'autres éléments (précisez)____________________	☐

5. (b) Quelle proportion des impacts positifs du réseau, s'il y en a eu, est-elle attribuable au simple fait d'avoir obtenu un financement additionnel plutôt qu'à d'autres facteurs comme le maillage, la gestion ou la formation? Inscrivez « ne sais pas » si vous ne le savez pas.

☐ Sans objet — les impacts ne sont pas positifs
☐ % Attribuable au financement additionnel de la recherche
☐ % Attribuable à d'autres facteurs

6. Votre recherche RCE sera-t-elle différente du type de recherche que vous faisiez avant de vous joindre au réseau?

☐ Oui

☐ Non

Si oui, comment sera-t-elle différente? (Cochez toutes les cases pertinentes.)

☐^{1} Le travail RCE est dans un nouveau domaine de recherche pour moi, porte sur de nouveaux sujets, ou fait appel à de nouvelles méthodes
☐^{2} Le travail RCE comporte des liens importants avec d'autres disciplines
☐^{3} Le travail RCE comprend de nouvelles collaborations importantes
☐^{4} Le travail RCE est plus orienté vers les besoins industriels
☐^{5} Le travail RCE est plus orienté vers les besoins gouvernementaux
☐^{6} Le travail RCE est plus orienté vers les soins de santé et les besoins sociaux
☐^{7} Autre, précisez ______________________________

7. Combien de personnes votre équipe de recherche compte-t-elle, sans égard à la source de fonds? Comptez les chercheurs de l'extérieur de votre laboratoire si leurs contributions à votre réseau sont importantes. Répondez en équivalent plein temps s'il y a lieu. **Inscrivez 0 si la réponse est zéro.**

Dans les 5 années précédant votre participation au réseau	**Depuis que vous êtes membre du réseau**	
☐	☐	Chercheurs chevronnés à votre université (y compris vous-même)
☐	☐	Chercheurs chevronnés à d'autres universités
☐	☐	Chercheurs industriels chevronnés (y compris vous-même)
☐	☐	Chercheurs chevronnés d'autres organismes, comme les gouvernements ou les hôpitaux (y compris vous-même)
☐	☐	Boursiers postdoctoraux
☐	☐	Étudiants aux cycles supérieurs
☐	☐	Autres assistants ou associés de recherche
☐	☐	Techniciens

8. Approximativement, quelle proportion de votre recherche est-elle multidisciplinaire? (Soit parce que vous travaillez dans plus d'une discipline ou parce que vous faites partie d'une équipe multidisciplinaire).

Votre recherche RCE	Votre autre recherche	
☐ %	☐ %	Depuis que vous faites partie du réseau (ou une fois que le programme du réseau sera arrêté)
s/o	☐ %	Pendant la même période avant que vous ne deveniez membre du réseau

S'il y a eu changement (ou si vous prévoyez un changement, quelle a été (sera) l'influence du réseau?

	Grande influence	Faible influence	Pas d'influence	Je ne sais pas	Ne s'applique pas - pas de changement
Sur votre travail RCE	☐1	☐2	☐3	☐4	☐5
Sur vos autres travaux	☐	☐	☐	☐	☐

9. Votre recherche RCE et votre autre recherche sont-elles différentes en ce qui concerne le niveau de risque? (Risque élevé réfère à un travail plus spéculatif, dont les résultats sont moins prévisibles.)

☐1 Le réseau appuie généralement de la recherche dont le risque est plus élevé

☐2 Le réseau appuie généralement de la recherche plus conservatrice, plus traditionnelle

☐3 Il n'y a pas vraiment de différences entre la recherche RCE et l'autre recherche

☐4 Je ne sais pas

Gestion du réseau

10. Selon vous, votre réseau a-t-il un système efficace de gestion pour les éléments suivants :

	Oui	Succès partiel	Non	Ne sais Pas
Choix de thèmes qui englobent les grands domaines nécessaires pour atteindre les objectifs d'ensemble du réseau	☐1	☐2	☐3	☐4
Choix de projets de recherche qui s'insèrent dans les thèmes du réseau	☐	☐	☐	☐
Affectation ou modification des budgets des divers projets	☐	☐	☐	☐
Identification des résultats de recherche susceptibles d'avoir des retombées commerciales ou sociales	☐	☐	☐	☐
Mesures pour aider les partenaires à acquérir les compétences nécessaires pour comprendre et utiliser les résultats de la recherche	☐	☐	☐	☐
Transfert formel ou non de technologies aux partenaires et à d'autres utilisateurs	☐	☐	☐	☐
Communication des activités du RCE à l'intérieur du réseau	☐	☐	☐	☐
Communication des activités du RCE à l'extérieur du réseau	☐	☐	☐	☐

Commentaires :

Collaboration et maillage

11. Veuillez estimer le niveau des collaborations et du maillage depuis que vous faites partie du réseau, comparativement à ce que vous faisiez auparavant. Utilisez cette échelle : 1 = beaucoup moins depuis le RCE; 2 = moins; 3 = comparable; 4 = plus; 5 = beaucoup plus. (Des cotes fractionnaires, p.ex. 3,6 sont acceptables. Utilisez « NSP » pour « Je ne sais pas » et « s/o » pour « sans objet ».) **Répondez « Aucune » si vous n'avez pas eu d'interaction.**

	Pour aider à planifier votre recherche	**Pour aider à effectuer votre recherche**	**Pour aider à appliquer vos résultats**
Avec des chercheurs universitaires	☐	☐	☐
Avec des représentants industriels	☐	☐	☐
Avec des représentants gouvernementaux	☐	☐	☐
Avec des représentants des hôpitaux ou des services de soins de santé	☐	☐	☐

Application subséquente des résultats de la recherche

12. Selon vous, quel genre d'applications pratiques devraient-elles découler de votre réseau? Veuillez cocher toutes les cases pertinentes.

☐*1* Applications improbables

Il y aura probablement des applications qui porteront sur :

☐*2* Les politiques ou règlements d'organismes gouvernementaux

☐*3* Les politiques ou règlements d'hôpitaux ou d'autres organismes de soins de santé (p.ex., ONG)

☐*4* Les politiques ou règlements de l'industrie

☐*5* Le diagnostic/traitement de maladies ou blessures ou identification de facteurs de risque

☐*6* Impacts sociaux (p.ex., meilleure éducation, meilleurs soins de santé pour les aînés, amélioration de la qualité de vie, impact sur l'environnement)

☐*7* Les sujets de R et D abordés par l'entreprise privée

☐*8* Les compétences de R et D de l'entreprise privée

☐*9* Les demandes de brevets, licences, ou autres formes de protection de la propriété intellectuelle

☐*10* D'autres investissements en R et D de la part du secteur privé et d'investisseurs

☐*11* De nouveaux produits, procédés ou services développées par ou pour l'industrie

☐*12* La création de nouveaux emplois, ou la rétention d'emplois qui aurait été perdus

☐*13* Autres, précisez ______________________

Dans combien de temps environ ces applications auront-elles lieu?

☐*1* Certaines ont déjà eu lieu

☐*2* D'ici 5 ans

☐*3* D'ici 6 à 10 ans

☐*4* Dans plus de 10 ans

☐*5* Je ne sais pas

Si votre recherche RCE a déjà eu des impacts de ce genre, veuillez fournir des explications :

Solutions de rechange au Programme

13. Dans l'ensemble, êtes-vous satisfait(e) du Programme RCE et de votre réseau?

	Très satisfait(e)	**Assez satisfait(e)**	**Pas très satisfait(e)**	**Pas du tout satisfait(e)**	**Je ne sais pas**
Du Programme RCE	☐1	☐2	☐3	☐4	☐5
De votre réseau	☐	☐	☐	☐	☐

14. Dans l'ensemble, quels sont le principaux avantages et désavantages de votre participation au réseau?

Avantages:

Désavantages:

15. Dans les limites du budget actuel du Programme RCE, y aurait-il, selon vous, une meilleure façon d'atteindre les buts du Programme?

16. Si le budget fédéral total d'aide à la recherche universitaire demeurait constant, quelle serait votre préférence pour ce qui est du Programme RCE?

☐ Je préférerais voir augmenter le Programme RCE, et donc diminuer les autres sources fédérales d'un montant équivalent. De combien augmenteriez vous les RCE? %

☐ Je préférerais que la répartition des fonds entre les programmes ne change pas

☐ Je préférerais voir diminuer le Programme RCE, et donc augmenter les autres sources d'un montant équivalent. De combien diminueriez-vous les RCE? %

☐ Je ne sais pas

17. Avez-vous d'autres commentaires sur le Programme RCE ou sur votre réseau?

Merci!

Veuillez retourner le questionnaire par la poste à :

Dennis Rank
The ARA Consulting Group
Suite 350 — 355 Burrard Street
Vancouver B.C. V6C 2G8

ou par télécopieur, à :

Dennis Rank
(604) 669-7390

Si vous avez des questions, veuillez composer le (604) 681-7577

Sondage auprès des chercheurs des RCE — Réseaux non renouvelés

Toute référence aux sources autres que le RCE réfère au financement en vertu des programmes comme ceux des conseils subventionnaires, des universités, des organismes provinciaux, de l'industrie, des hôpitaux, des fondations, ainsi de suite. Toutes les réponses demeureront confidentielles et les résultats seront présentés de façon globale. Merci de votre collaboration.

Renseignements généraux

1. De quel réseau faisiez-vous partie? ____________________
(Ce réseau sera appelé « le réseau ou le RCE » dans ce questionnaire)

2. Lorsque vous participiez au réseau, votre employeur principal était :
   - ☐1 une université
   - ☐2 une société privée
   - ☐3 un hôpital
   - ☐4 un organisme gouvernemental
   - ☐5 autre, précisez ____________________

Impact du Programme RCE sur la recherche

3. En gros, combien d'argent par année, en moyenne, recevez-vous pour votre recherche? N'incluez que votre part des subventions conjointes. Ne tenez pas compte de l'inflation. **Inscrivez « 0 » si la réponse est zéro.**

Dans les 5 années précédant votre participation au réseau	**Pendant que vous étiez membre du réseau**	**Depuis la fin de votre réseau**	**Note : a = b + c**
☐ $	☐ $	☐ $	a) Montant annuel moyen approximatif (toutes sources)
s/o $	☐ $	☐ $	b) Portion du total qui venait du RCE
☐ $	☐ $	☐ $	c) Portion d'autres sources que le RCE

4. En gros, quelle proportion du financement de votre recherche va à la recherche fondamentale et à la recherche appliquée?

	Dans les 5 années précédant votre participation au réseau	**Pendant que vous étiez membre du réseau**	**Depuis la fin de votre réseau**
Fondamentale	☐ %	☐ %	☐ %
Appliquée	☐ %	☐ %	☐ %

5. Si votre financement annuel total a changé depuis la fin du réseau, ou si l'équilibre entre la recherche fondamentale et appliquée a changé, quelle a été l'influence de la fin du réseau sur ce changement?

	Influence sur le financement total	**Influence sur l'équilibre fondamental/appliqué**
Grande influence	☐1	☐1
Faible influence	☐2	☐2
Aucune influence	☐3	☐3
Je ne sais pas	☐4	☐4
Sans objet (peu ou pas de changement)	☐5	☐5

6. Votre recherche RCE était-elle différente du genre de recherche que vous faisiez avant de vous joindre au réseau?

☐ Oui
☐ Non

Si vous avez répondu oui, comment était-elle différente? (Cochez toutes les cases pertinentes.)

☐[1] Grâce au RCE, je suis entré(e) dans un nouveau domaine de recherche, j'ai abordé de nouveaux sujets ou utilisé de nouvelles méthodes
☐[2] Le travail RCE comportait des liens importants avec d'autres disciplines, facilités par le réseau
☐[3] Le travail RCE comprenait de nouvelles collaborations importantes, amorcées grâce au réseau
☐[4] Le travail RCE était plus orienté vers les besoins industriels
☐[5] Le travail RCE était plus orienté vers les besoins gouvernementaux
☐[6] Le travail RCE était plus orienté vers les soins de santé et les besoins sociaux
☐[7] Autre, précisez ____________________

7. Lequel des énoncés suivants décrit-il mieux votre programme de recherche actuel?

☐[1] C'est essentiellement la même chose que mon travail RCE ou que le travail que je faisais avant de me joindre au réseau.
☐[2] C'est essentiellement la même chose que mon travail RCE, mais c'est différent du travail que je faisais avant de me joindre au réseau.
☐[3] C'est essentiellement la même chose que ce que je faisais avant le réseau, mais différent de mon travail RCE.
☐[4] C'est différent de mon travail RCE et de celui que je faisais auparavant.

8. (a) Nous sommes intéressés par votre opinion de l'impact sur votre recherche de certaines des caractéristiques de votre réseau. Pour chacun des éléments énoncés ci-dessous, veuillez indiquer l'impact du réseau sur votre recherche en utilisant une échelle de -5 à +5, où -5 = un impact négatif important; 0 = aucun impact; et +5 = impact positif important. Inscrivez NSP si vous ne savez pas.

Impact du financement additionnel que vous avez reçu du réseau	☐[1]
Impact du maillage et de la collaboration	☐[2]
Impact de la gestion du réseau	☐[3]
Impact des interactions avec des sources externes (p.ex. industrie, gouvernements, hôpitaux)	☐[4]
Impact de l'appui du réseau à la formation de personnes hautement qualifiées	☐[5]
Impact d'autres éléments précisez)? ____________________	☐[6]

8. (b) Quelle proportion des impacts positifs du réseau, s'il y en a eu, est-elle attribuable au simple fait d'avoir obtenu un financement additionnel plutôt qu'à d'autres facteurs comme le maillage, la gestion ou la formation? Inscrivez « ne sais pas » si vous ne le savez pas.

☐ Sans objet — les impacts ne sont pas positifs
☐ % Attribuable au financement additionnel de la recherche
☐ % Attribuable à d'autres facteurs

9. Votre participation au RCE a-t-elle changé votre attitude face à la collaboration ou à la recherche appliquée?

	Face à la collaboration	**Face à la recherche appliquée**
Mon attitude est plus positive maintenant	☐1	☐1
Mon attitude n'a pas changé	☐2	☐2
Mon attitude est plus négative maintenant	☐3	☐3

S'il y a eu changement d'attitude, veuillez donner des explications :

10. Quelle a été l'influence du réseau sur votre programme actuel de recherche?

	A augmenté à cause du RCE	**Comparable**	**A diminué à cause du RCE**	**Je ne sais pas**
La valeur scientifique de votre recherche	☐1	☐2	☐3	☐4
Concentration sur les besoins de l'industrie ou impact sur elle	☐	☐	☐	☐
Concentration sur les besoins des gouvernements ou impact sur eux	☐	☐	☐	☐
Concentration sur les besoins des soins de santé ou impact sur eux	☐	☐	☐	☐
Concentration sur d'autres besoins sociaux	☐	☐	☐	☐
Concentration sur les besoins de formation ou impact sur la formation	☐	☐	☐	☐

11. Combien de personnes votre équipe RCE comptait-elle et combien votre équipe actuelle en compte-t-elle, sans égard à la source de fonds? Comptez les chercheurs de l'extérieur de votre laboratoire si leurs contributions à votre réseau sont importantes. ***Répondez en équivalent plein temps s'il y a lieu*. Inscrivez « 0 » si la réponse est zéro.**

Avant le RCE	**Pendant le RCE**	**Maintenant**	
			Chercheurs chevronnés à votre université (y compris vous-même)
			Chercheurs chevronnés à d'autres universités
			Chercheurs industriels chevronnés (y compris vous-même)
			Chercheurs chevronnés d'autres organismes, comme les gouvernements ou les hôpitaux (y compris vous-même)
			Boursiers postdoctoraux
			Étudiants aux cycles supérieurs
			Autres assistants ou associés de recherche
			Techniciens

12. Dans votre recherche actuelle, jusqu'à quel point avez-vous maintenu les collaborations établies lorsque vous faisiez partie du réseau?

	Je collabore davantage maintenant	**Comparable**	**Je collabore moins maintenant**	**Je n'ai pas de collaboration active**
Avec les chercheurs de votre université (s'il y a lieu)	☐1	☐2	☐3	☐4
Avec les chercheurs d'autres univ. (s'il y a lieu)	☐	☐	☐	☐
Avec l'industrie	☐	☐	☐	☐
Avec les gouvernements	☐	☐	☐	☐
Avec les hôpitaux /organismes de soins de santé	☐	☐	☐	☐
Autres, précisez ____________________	☐	☐	☐	☐

13. Approximativement, quelle proportion de votre recherche est-elle multidisciplinaire? (Soit parce que vous travaillez dans plus d'une discipline ou parce que vous faites partie d'une équipe multidisciplinaire).

Votre recherche RCE	**Votre autre recherche**	
s/o %	☐ %	Lorsque vous faisiez partie du réseau
☐ %	☐ %	Pendant que vous étiez membre du réseau
s/o	☐ %	Depuis la fin du réseau

14. S'il y a eu changement, quelle été l'influence de la fin du réseau?

- ☐1 Grande influence
- ☐2 Faible influence
- ☐3 Pas d'influence
- ☐4 Je ne sais pas
- ☐5 Sans objet - aucun changement

Impact sur la formation de personnel hautement qualifié

15. La formation des jeunes chercheurs (c-à-d. stagiaires postdoctoraux, étudiants aux cycles supérieurs) au sein du réseau différait-elle de la formation offerte dans le cadre de recherche appuyée par d'autres sources? Utilisez cette échelle : I = la formation RCE était moins bonne; 2 = la formation RCE était à peu près équivalente; 3 = la formation RCE était meilleure. Utilisez NSP si vous ne savez pas, ou « s/o » si votre réseau n'offre pas ce genre de formation.

Formation des stagiaires postdoctoraux	**Formation des étudiants aux cycles supérieurs**	**Nature de l'impact**
☐	☐	Qualité d'ensemble de la formation scientifique
☐	☐	Exposition aux utilisateurs de l'industrie, des gouvernements, des services de soins de santé
☐	☐	Participation à la planification et à la gestion des projets de recherche
☐	☐	Expérience avec de l'équipement de pointe
☐	☐	Contacts professionnels et maillage
☐	☐	Impact sur le prestige et la carrière
☐	☐	Facilité à trouver un emploi

S'il y a une différence, veuillez donner des explications :

Gestion du réseau

16. Selon vous, votre réseau avait-il un système efficace de gestion pour les éléments suivants :

	Oui	**Succès partiel**	**Non**	**Ne sais pas**
Choix de thèmes qui englobent les grands domaines nécessaires pour atteindre les objectifs d'ensemble du réseau	☐ 1	☐ 2	☐ 3	☐ 4
Choix de projets de recherche qui s'insèrent dans les thèmes du réseau	☐	☐	☐	☐
Affectation ou modification des budgets des divers projets	☐	☐	☐	☐
Identification des résultats de recherche susceptibles d'avoir des retombées commerciales ou sociales	☐	☐	☐	☐
Mesures pour aider les partenaires à acquérir les compétences nécessaires pour comprendre et utiliser les résultats de la recherche	☐	☐	☐	☐
Transfert formel ou non de technologies aux partenaires et à d'autres utilisateurs	☐	☐	☐	☐
Communication des activités du RCE à l'intérieur du réseau	☐	☐	☐	☐
Communication des activités du RCE à l'extérieur du réseau	☐	☐	☐	☐

Commentaires :

Décrivez les principaux impacts (positifs et négatifs) de la gestion du réseau sur votre recherche :

Impacts positifs :

Impacts négatifs :

Application subséquente des résultats de la recherche

17. Selon vous, quel genre d'applications pratiques devraient-elles découler de votre réseau? Veuillez cocher toutes les cases pertinentes.

☐[1] Applications improbables

Il y aura probablement des applications qui porteront sur :

☐[2] Les politiques ou règlements d'organismes gouvernementaux
☐[3] Les politiques ou règlements d'hôpitaux ou d'autres organismes de soins de santé
☐[4] Les politiques ou règlements de l'industrie
☐[5] Le diagnostic/traitement de maladies ou blessures ou identification de facteurs de risque
☐[6] D'autres impacts sociaux (p.ex., meilleure éducation, meilleurs services pour les aînés, amélioration de la qualité de vie, impact sur l'environnement)
☐[7] Les sujets de R et D abordés par l'entreprise privée
☐[8] Les compétences de R et D de l'entreprise privée
☐[9] Les demandes de brevets, licences, ou autres formes de protection de la propriété intellectuelle
☐[10] D'autres investissements en R et D de la part du secteur privé et d'investisseurs
☐[11] De nouveaux produits, procédés ou services développés par ou pour l'industrie
☐[12] La création de nouveaux emplois, ou la rétention d'emplois qui aurait été perdus
☐[13] Autres, précisez ________________________________

Dans combien de temps environ ces applications auront-elles lieu?

☐[1] Certaines ont déjà eu lieu
☐[2] D'ici 5 ans
☐[3] D'ici 6 à 10 ans
☐[4] Dans plus de 10 ans
☐[5] Je ne sais pas

Si votre recherche RCE a déjà eu des impacts de ce genre, veuillez fournir des explications :

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Impact des politiques de la phases II

18. Dans la phase II du Programme RCE, les buts et les politiques ont été quelque peu modifiés par rapport à la phase I. Jusqu'à quel point êtes-vous informé(e) de ces changements?

☐[1] Je suis très bien informé(e)
☐[2] Je suis assez bien informé(e)
☐[3] Je ne suis pas très bien informé(e)
☐[4] Je ne suis pas informé(e) du tout.

Selon vous, quelles sont les différences entre la phase I et la phase II?

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19. Les buts de la phase II sont-ils appropriés pour le programme dans son ensemble? Auraient-ils été appropriés pour votre réseau s'il avait été renouvelé?

	Oui	Non	Ne sais pas
Pour le programme	☐	☐	☐
Pour votre réseau	☐	☐	☐

Solutions de rechange au Programme

20. Dans l'ensemble, êtes-vous satisfait(e) du Programme RCE et de votre réseau?

	Très satisfait(e)	Assez satisfait(e)	Pas très satisfait(e)	Pas du tout satisfait(e)	Ne sais pas
Du Programme RCE	☐^{1}	☐^{2}	☐^{3}	☐^{4}	☐^{5}
De votre réseau	☐	☐	☐	☐	☐

21. Dans l'ensemble, quels ont été les avantages et désavantages les plus durables de votre participation au réseau?

Avantages:

Désavantages:

22. Dans les limites du budget actuel du Programme RCE, y aurait-il, selon vous, une meilleure façon d'atteindre les buts du Programme?

23. Avez-vous d'autres commentaires sur le Programme RCE ou sur votre réseau?

Merci!

Veuillez retourner le questionnaire par la poste à :
Dennis Rank
The ARA Consulting Group
Suite 350 — 355 Burrard Street
Vancouver B.C. V6C 2G8

ou par télécopieur, à :
Dennis Rank
(604) 669-7390

Si vous avez des questions, veuillez composer le (604) 681-7577

Sondage auprès des partenaires des RCE : Questions d'ordre général — Réseaux renouvelés

Ce sondage comporte des questions d'ordre général sur le Programme RCE et sur le réseau avec lequel vous avez des liens. Il comporte également des questions sur les impacts sociaux et économiques de la recherche. Il se peut que différentes personnes doivent répondre aux deux séries de questions — si tel est le cas, veuillez remettre ce questionnaire aux personnes les plus appropriées. **Les réponses individuelles demeureront confidentielles et les réseaux n'y auront pas accès. ARA présentera les résultats de façon globale.** Merci de votre collaboration.

Renseignements généraux

1. De quel réseau êtes-vous partenaire? ______________________________
   (Ce réseau sera appelé « le réseau ou le RCE » dans ce questionnaire)

2. Au cas où nous devrions vous contacter pour obtenir d'autres détails, veuillez inscrire votre adresse. **Cette information ne sera utilisée que par ARA.**

   Nom ______________________________

   Poste ______________________________

   Organisme ______________________________

   Téléphone ______________________________

3. Votre organisation est :

   ☐ une société privée
   ☐ un hôpital
   ☐ un organisme gouvernemental
   ☐ autre, précisez ______________________________

4. Approximativement, quel est le budget annuel de recherche-développement (salaires et dépenses) de votre organisation au Canada? **Inscrivez « 0 » si la réponse est zéro.**

   ☐ $ Total au Canada (y compris les contrats externes, les contributions au réseau, etc.)
   ☐ $ Montant du total canadien portant sur le sujet général du réseau
   ☐ $ Montant annuel de votre contribution en espèces la plus récente au réseau lui-même

5. En gros, quel pourcentage de vos revenus canadiens consacrez-vous à la R-D? ☐ %

Participation au Programme de recherche du réseau

6. Votre organisation participe-t-elle activement aux activités suivantes :

☐1 Conseil d'administration du réseau
☐2 Comité de la recherche du réseau
☐3 Comité de transfert technologique, de liaison industrielle ou de propriété intellectuelle
☐4 Comité sur le maillage ou les communications
☐5 Autre, précisez____

7. Quel est l'apport de votre organisation aux activités du réseau?

	Élevé	**Moyen**	**Faible**	**Ne sais pas**
Conseil ou comité du réseau	☐	☐	☐	☐
Planification d'ensemble du programme de recherche ou des projets individuels	☐	☐	☐	☐
Contribution à la conduite de la recherche du réseau	☐	☐	☐	☐
Contribution à l'examen et aux rajustements du programme de recherche du réseau	☐	☐	☐	☐
Application des résultats de recherche du réseau	☐	☐	☐	☐

8. Votre apport a-t-il été aussi élevé que souhaité?

	Oui	**Non**	**Ne sais pas**
Conseil ou comité du réseau	☐	☐	☐
Planification d'ensemble du programme de recherche ou des projets individuels	☐	☐	☐
Contribution à la conduite de la recherche du réseau	☐	☐	☐
Contribution à l'examen et aux rajustements du programme de recherche du réseau	☐	☐	☐
Application des résultats de recherche du réseau	☐	☐	☐

Veuillez donner vos commentaires :

Questions sur le Programme

9. Êtes-vous satisfait(e) des buts et des politiques de la Phase II du Programme RCE?

☐1 Très satisfait(e)
☐2 Assez satisfait(e)
☐3 Pas très satisfait(e)
☐4 Pas du tout satisfait(e)
☐5 Je ne sais pas
☐6 Je ne suis pas au courant des buts et des politiques

10. De quelle façon les nouveaux buts et politiques de la Phase II ont-ils affecté les éléments suivants?

	Plus élevée(s)	Pas de changement	Plus faible(s)	Ne sais pas
Votre satisfaction d'ensemble au sujet des buts et politiques du Programme RCE	☐	☐	☐	☐
Votre satisfaction au sujet de votre réseau	☐	☐	☐	☐
Votre volonté de participer au réseau	☐	☐	☐	☐
Vos attentes que le réseau produira des résultats utiles pour votre organisation	☐	☐	☐	☐
Votre volonté de contribuer en nature au réseau	☐	☐	☐	☐
Votre volonté de contribuer en espèces au réseau	☐	☐	☐	☐
Autre. Précisez ______________________	☐	☐	☐	☐

Veuillez expliquer votre réponse.

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Pertinence de la recherche du réseau

11. La plupart des programmes de recherche des réseaux sont divisés en thèmes ou groupes, puis subdivisés en projets ou sous-projets. Décrivez la pertinence des éléments suivants pour votre organisation.

	Élevée	Moyenne	Faible	Ne sais pas	Sans objet
Le programme d'ensemble de recherche du réseau	☐	☐	☐	☐	☐
Le thème ou le groupe auquel votre organisation a participé le plus	☐	☐	☐	☐	☐
Le ou les projets auxquels votre organisation a participé	☐	☐	☐	☐	☐

12. Votre réseau a-t-il des systèmes efficaces de gestion aux fins suivantes :

	Oui	un peu	non	ne sais pas
Gérer le programme de recherche	☐	☐	☐	☐
Assurer la pertinence de la recherche pour les organismes partenaires	☐	☐	☐	☐
Identifier les résultats de recherche susceptibles de mener à des retombées commerciales ou sociales	☐	☐	☐	☐
Transférer, officiellement ou non, les technologies aux partenaires et à d'autres utilisateurs	☐	☐	☐	☐
Communiquer les activités du réseau à l'intérieur du réseau	☐	☐	☐	☐
Communiquer les activités du réseau à l'extérieur du réseau	☐	☐	☐	☐

Sinon, quels changements faudrait-il apporter?

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13. Votre organisation a-t-elle les compétences techniques nécessaires pour utiliser et exploiter les résultats de la recherche du réseau sous leur forme actuelle? Le réseau a-t-il eu une influence sur vos compétences techniques?

	Élevée(s)	**Moyenne(s)**	**Faible(s)**	**Ne sais pas**
Les compétences techniques de votre organisation	☐	☐	☐	☐
L'influence du réseau sur vos compétences techniques	☐	☐	☐	☐

Veuillez donner des commentaires :

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Le réseau devrait-il jouer un rôle dans l'amélioration de vos compétences techniques?

☐ Oui. Comment?______________________________

☐ Non. Pourquoi?______________________________

☐ Je ne sais pas

14. Veuillez indiquer jusqu'à quel point le réseau a été utile pour votre organisation jusqu'à maintenant et le sera à l'avenir. Utilisez cette échelle : 1 = aucune utilité; 2 = peu d'utilité; 3 = assez d'utilité; 4 = utilité élevée; 5 = utilité très élevée

Utilité jusqu'à maintenant	**Utilité probable à l'avenir**	**Utilité pour influencer**
☐ *1*	☐ *13*	Les politiques ou règlements d'organismes gouvernementaux (le vôtre, s'il y a lieu)
☐ *2*	☐ *14*	Les politiques ou règlements d'hôpitaux ou d'autres organismes de soins de santé (le vôtre, s'il y a lieu)
☐ *3*	☐ *15*	Les politiques ou règlements de l'industrie (votre société, s'il y a lieu)
☐ *4*	☐ *16*	Identification/diagnostic/traitement de maladies ou blessures ou identification de facteurs de risque
☐ *5*	☐ *17*	D'autres impacts sociaux (p.ex., meilleure éducation, meilleurs soins de santé pour les aînés, amélioration de la qualité de vie, impact sur l'environnement)
☐ *6*	☐ *18*	Les sujets de R et D abordés par l'entreprise privée (votre société, s'il y a lieu)
☐ *7*	☐ *19*	Les compétences de R et D de l'entreprise privée (votre société, s'il y a lieu)
☐ *8*	☐ *20*	Les demandes de brevets, licences, ou autres formes de protection de la propriété intellectuelle
☐ *9*	☐ *21*	D'autres investissements en R et D de la part du secteur privé et d'investisseurs (votre organisation, s'il y a lieu)
☐ *10*	☐ *22*	De nouveaux produits, procédés ou services que l'industrie développe activement (votre société, s'il y a lieu)
☐ *11*	☐ *23*	La création de nouveaux emplois ou la rétention d'emplois qui auraient été perdus Combien d'emplois dans votre organisation? ☐
☐ *12*	☐ *24*	Autres, précisez ____________________

Veuillez donner des commentaires :

15. Pour votre organisation, certains des résultats de recherche du réseau ont-ils le potentiel de contribuer à générer des revenus importants relativement à votre investissement dans cette recherche (ou à diminuer des coûts)?

☐ Oui ☐ Non ☐ Ne sais pas ☐ Sans objet

Si oui, dans combien de temps?

Certains ont déjà contribué	D'ici 5 ans	D'ici 6 à 10 ans	Dans plus de 10 ans	Je ne sais pas
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Si oui, pourrait-on vous contacter pour obtenir des renseignements à ce sujet? ☐ Oui ☐ Non

16. Certains des résultats de recherche du réseau ont-ils le potentiel de produire des retombées sociales (p.ex. amélioration des soins de santé, de la qualité de vie ou de l'environnement)?

☐ Oui ☐ Non ☐ Ne sais pas ☐ Sans objet

Si oui, dans combien de temps?

Certains ont déjà contribué	D'ici 5 ans	D'ici 6 à 10 ans	Dans plus de 10 ans	Je ne sais pas
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Si oui, pourrait-on vous contacter pour obtenir des renseignements à ce sujet? ☐ Oui ☐ Non

17. Si le réseau n'a pas encore été très utile jusqu'à maintenant, et si, à votre avis, il est peu probable qu'il le soit davantage à l'avenir, quels sont les facteurs qui ont contribué à ce manque d'utilité?

☐ 1 Votre organisation n'est pas très au courant des résultats de la recherche

☐ 2 Vous ne disposez pas des compétences techniques nécessaires pour appliquer les résultats

☐ 3 La qualité d'ensemble de la recherche n'est pas très élevée

☐ 4 La recherche est à long terme, et il est trop tôt pour savoir jusqu'à quel point elle sera utile

☐ 5 La recherche n'est pas dans des domaines pertinents pour votre organisation

☐ 6 Autre, précisez ______________________

18. Votre organisation aurait-elle effectué certains des projets du réseau même si le réseau n'avait pas existé?

☐ Non, aucun projet n'aurait été réalisé en l'absence du réseau

☐ Oui, une partie du travail aurait été faite de toute façon

Si oui, quels auraient été les coûts approximatifs additionnels (salaires et dépenses) sans l'apport du réseau? ☐ $

☐ Ne sais pas

Si votre organisation avait effectué elle-même une partie de la recherche, y aurait-il eu un délai?

☐ Oui. Si oui, un délai de? ☐ ans

☐ Non

☐ Ne sais pas

Impact sur la formation de personnel qualifié

19. Dans l'ensemble, quelle est l'importance du réseau pour faciliter l'accès de votre organisation à des personnes hautement qualifiées?

	Très important	Assez important	Pas très important	Pas important	Ne sais pas
Accès à des chercheurs universitaires hautement qualifiés	☐ 1	☐ 2	☐ 3	☐ 4	☐5
Accès à des étudiants très bien formés que vous pourriez recruter	☐	☐	☐	☐	☐

20. Depuis que vous participez au réseau, approximativement combien de diplômés de maîtrise ou de doctorat ou de stagiaires postdoctoraux votre organisation a-t-elle recruté dans le même domaine de recherche que le réseau? Répondez « 0 » si la réponse est zéro et NSP si vous ne savez pas.

Total	Maîtrise	Doctorat	Postdoctorat	
☐	☐	☐	☐	Nombre de recrues ayant reçu leur formation au sein du réseau
☐	☐	☐	☐	Nombre ayant reçu leur formation à l'extérieur du réseau

21. Avez-vous perçu une différence dans les compétences et les connaissances des recrues selon qu'elles ont reçu leur formation, en tout ou en partie, au sein du réseau?

Les personnes formées au sein du réseau sont :

	Meilleures	Equi-valentes	Moins bonnes	Ne sais pas
Compétences techniques	☐	☐	☐	☐
Connaissance des besoins et priorités de votre organisation	☐	☐	☐	☐

Veuillez donner des commentaires :

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Conclusions

22. Comparez les avantages pour votre organisation de la recherche du réseau et de la recherche universitaire « ordinaire », c'est-à-dire, hors réseau.

	Le réseau offre moins d'avantages	Le réseau et la recherche ordinaire sont comparables	Le réseau offre plus d'avantages	Ne sais pas
Accès à de la recherche universitaire pertinente et à des chercheurs de haute qualité	☐	☐	☐	☐
Accès à du nouveau personnel bien formé	☐	☐	☐	☐
Transfert technologique vers votre organisation	☐	☐	☐	☐
Autre, précisez ____________________	☐	☐	☐	☐

23. Dans l'ensemble, êtes-vous satisfait(e) du Programme RCE et de votre réseau?

	Du Programme RCE	De votre réseau
Très satisfait(e)	☐	☐
Assez satisfait(e)	☐	☐
Pas très satisfait(e)	☐	☐
Pas du tout satisfait(e)	☐	☐

24. Dans l'ensemble, quels sont, pour votre organisation, les principaux avantages et désavantages de votre participation au réseau?

Avantages :

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Désavantages :

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25. Dans les limites du budget actuel du Programme RCE, y aurait-il, selon vous, une meilleure façon d'atteindre les buts du programme?

26 Avez-vous d'autres commentaires sur le Programme RCE ou sur votre réseau?

Merci! **Veuillez retourner le questionnaire**

par la poste :

Dennis Rank
The ARA Consulting Group
350 — 355 Burrard Street
Vancouver, B.C. V6C 2G8

ou par télécopieur :

Dennis Rank
(604) 669-7390

Si vous avez des questions, veuillez composer le (604) 681-7577

Sondage auprès des partenaires des RCE : Questions d'ordre général — Nouveaux réseaux

Les réponses individuelles demeureront confidentielles et les réseaux n'y auront pas accès. ARA présentera les résultats de façon globale. Merci de votre collaboration.

Renseignements généraux

1. De quel réseau êtes-vous partenaire?________________________________
(Ce réseau sera appelé « le réseau ou le RCE » dans ce questionnaire)

2. Au cas où nous devrions vous contacter pour obtenir d'autres détails, veuillez inscrire votre adresse. **Cette information ne sera utilisée que par ARA**.

Nom ________________________________
Poste ________________________________
Organisme ________________________________
Téléphone ________________________________

3. Votre organisation est :

☐ une société privée
☐ un hôpital
☐ un organisme gouvernemental
☐ autre, précisez ________________________________

4. Approximativement, quel est le budget annuel de recherche-développement (salaires et dépenses) de votre organisation au Canada? **Inscrivez « 0 » si la réponse est zéro.**

☐ $ Total au Canada (y compris les contrats externes, les contributions au réseau, etc.)
☐ $ Montant du total canadien portant sur le sujet général du réseau
☐ $ Montant annuel de votre contribution en espèces la plus récente au réseau lui-même

5. En gros, quel pourcentage de vos revenus canadiens consacrez-vous à la R-D? ☐ %

6. La plupart des programmes de recherche des réseaux sont divisés en thèmes ou groupes, puis subdivisés en projets ou sous-projets. Décrivez la pertinence des éléments suivants pour votre organisation.

	Élevée	Moyenne	Faible	Ne sais pas	Sans objet
Le programme d'ensemble de recherche du réseau	☐	☐	☐	☐	☐
Le thème ou le groupe auquel votre organisation participe le plus	☐	☐	☐	☐	☐
Le ou les projets auxquels votre organisation participe	☐	☐	☐	☐	☐

Participation au Programme de recherche du réseau

7. Votre organisation participe-t-elle activement aux activités suivantes :

☐$_1$ Conseil d'administration du réseau
☐$_2$ Comité de la recherche du réseau
☐$_3$ Comité de transfert technologique, de liaison industrielle ou de propriété intellectuelle
☐$_4$ Comité sur le maillage ou les communications
☐$_5$ Autre, précisez____

8. Quel est l'apport de votre organisation aux activités du réseau?

	Élevée	Moy-enne	Faible	Ne sais pas
Conseil ou comité du réseau	☐	☐	☐	☐
Planification d'ensemble du programme de recherche ou des projets individuels	☐	☐	☐	☐
Contribution à la conduite de la recherche du réseau	☐	☐	☐	☐
Contribution à l'examen et aux rajustements du programme de recherche du réseau	☐	☐	☐	☐
Application des résultats de recherche du réseau	☐	☐	☐	☐

9. Votre apport a-t-il été aussi élevé que souhaité?

	Oui	Non	Ne sais pas
Conseil ou comité du réseau	☐	☐	☐
Planification d'ensemble du programme de recherche ou des projets individuels	☐	☐	☐
Contribution à la conduite de la recherche du réseau	☐	☐	☐
Contribution à l'examen et aux rajustements du programme de recherche du réseau	☐	☐	☐
Application des résultats de recherche du réseau	☐	☐	☐

Veuillez donner vos commentaires

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Questions sur le Programme

10. Êtes-vous satisfait(e) des buts et des politiques de la Phase II du Programme RCE?

☐$_1$ Très satisfait(e)
☐$_2$ Assez satisfait(e)
☐$_3$ Pas très satisfait(e)
☐$_4$ Pas du tout satisfait(e)
☐$_5$ Je ne sais pas
☐$_6$ Je ne suis pas au courant des buts et des politiques

11. Votre réseau a-t-il des systèmes efficaces de gestion aux fins suivantes :

	Oui	**Un peu**	**Non**	**Ne sais pas**
Gérer le programme de recherche	☐	☐	☐	☐
Assurer la pertinence de la recherche pour les organismes partenaires	☐	☐	☐	☐
Identifier les résultats de recherche susceptibles de mener à des retombées commerciales ou sociales	☐	☐	☐	☐
Transférer, officiellement ou non, les technologies aux partenaires et à d'autres utilisateurs	☐	☐	☐	☐
Communiquer les activités du réseau à l'intérieur du réseau	☐	☐	☐	☐
Communiquer les activités du réseau à l'extérieur du réseau	☐	☐	☐	☐

Sinon, quels changements faudrait-il apporter?

____

____

____

____

12. Votre organisation a-t-elle les compétences techniques nécessaires pour utiliser et exploiter les résultats de la recherche du réseau sous leur forme actuelle? Le réseau a-t-il eu une influence sur vos compétences techniques?

	Elevée(s)	**Moyenne(s)**	**Faible(s)**	**Ne sais pas**
Les compétences techniques de votre organisation	☐	☐	☐	☐
L'influence du réseau sur vos compétences techniques	☐	☐	☐	☐

Veuillez donner des commentaires :

____

____

____

Le réseau devrait-il jouer un rôle dans l'amélioration de vos compétences techniques?

☐ Oui. Comment? ____________________

☐ Non. Pourquoi? ____________________

☐ Je ne sais pas

13. Veuillez indiquer jusqu'à quel point, selon vous, le réseau sera utile pour votre organisation. Utilisez cette échelle : 1 = aucune utilité; 2 = peu d'utilité; 3 = assez d'utilité; 4 = utilité élevée; 5 = utilité très élevée

Utilité probable à l'avenir		Utilité pour influencer
☐	1	Les politiques ou règlements d'organismes gouvernementaux (le vôtre, s'il y a lieu)
☐	2	Les politiques ou règlements d'hôpitaux ou d'autres organismes de soins de santé (le vôtre, s'il y a lieu)
☐	3	Les politiques ou règlements de l'industrie (votre société, s'il y a lieu)
☐	4	Identification/diagnostic/traitement de maladies ou blessures ou identification de facteurs de risque
☐	5	D'autres impacts sociaux (p.ex., meilleure éducation, meilleurs soins de santé pour les aînés, amélioration de la qualité de vie, impact sur l'environnement)
☐	6	Les sujets de R et D abordés par l'entreprise privée (votre société, s'il y a lieu)
☐	7	Les compétences de R et D de l'entreprise privée (votre société, s'il y a lieu)
☐	8	Les demandes de brevets, licences, ou autres formes de protection de la propriété intellectuelle
☐	9	D'autres investissements en R et D de la part du secteur privé et d'investisseurs (votre organisation, s'il y a lieu)
☐	10	De nouveaux produits, procédés ou services que l'industrie développe activement (votre société, s'il y a lieu)
☐	11	La création de nouveaux emplois, ou la rétention d'emplois qui auraient été perdus
☐	12	Combien d'emplois dans votre organisation? ____________________

14. Votre organisation aurait-elle effectué certains des projets du réseau même si le réseau n'avait pas existé?

☐ Non, aucun projet n'aurait été réalisé en l'absence du réseau

☐ Oui, une partie du travail aurait été faite de toute façon

Si oui, quels auraient été les coûts approximatifs additionnels (salaires et dépenses) sans l'apport du réseau ☐ $

☐ Ne sais pas

15. Comparez les avantages pour votre organisation de la recherche du réseau et de la recherche universitaire « ordinaire », c'est-à-dire, hors réseau.

	Le réseau offre moins d'avantages	Le réseau et la recherche ordinaire sont comparables	Le réseau offre plus d'avantages	Ne sais pas
Accès à de la recherche universitaire pertinente et à des chercheurs de haute qualité	☐	☐	☐	☐
Accès à du nouveau personnel bien formé	☐	☐	☐	☐
Transfert technologique vers votre organisation	☐	☐	☐	☐
Autre, précisez ____________	☐	☐	☐	☐

16. Dans l'ensemble, êtes-vous satisfait(e) du Programme RCE et de votre réseau jusqu'à maintenant?

	Du Programme RCE	De votre réseau
Très satisfait(e)	☐	☐
Assez satisfait(e)	☐	☐
Pas très satisfait(e)	☐	☐
Pas du tout satisfait(e)	☐	☐

17. Dans l'ensemble, quels sont, pour votre organisation, les principaux avantages et désavantages de votre participation au réseau?

Avantages

____

____

____

Désavantages

____

____

____

18. Dans les limites du budget actuel du Programme RCE, y aurait-il, selon vous, une meilleure façon d'atteindre les buts du programme?

____

____

____

19. Avez-vous d'autres commentaires sur le Programme RCE ou sur votre réseau?

____

____

____

Merci! **Veuillez retourner le questionnaire**

par la poste :	par télécopieur :
Dennis Rank The ARA Consulting Group 350 - 355 Burrard Street Vancouver, B.C. V6C 2G8	Dennis Rank (604) 669-7390

Si vous avez des questions, veuillez composer le (604) 681-7577

APPENDIX O

INTERVIEW GUIDES

Interview Guide for Scientific and Network Directors:

Renewed Networks — General Information

Background

Name: ______________________________

Phone: ______________________________

Fax: ______________________________

Network: __________________________

Preliminary Discussion

In all questions below, we are particularly interested in the value added by the NCE approach to science and technology transfer — what impacts are there that would not have occurred without the existence of the program? Where appropriate, please give detailed examples of effects you have observed at your own network, or in the program as a whole. In addition, we are interested in the factors that have influenced the success of your network, and the consequences of the reorientation of NCE goals and policies for Phase II.

Quality and Relevance of the Network Research — Issue 1

1. How has the network affected the scientific nature of research being carried out by network researchers? Especially, how does NCE research differ from that supported by other funding sources?

- Scientific merit
- Balance of conservative versus risky research
- Multidisciplinarity
- Balance of fundamental versus applied research
- Quantity

2. How does the network research compare to international standards of excellence? If high: Are there any specific measures that support this belief?

3. Do you think there are specific network research results that would not have occurred in the same time span, with the same funding, without the network structure? Which? Why?

4. How does overall network research productivity compare to that of non-NCE university research? If your believe there are differences, what evidence is there?

5. Roughly what proportion of your network's research is

- "Discovery research" (fundamental, long-term) [Please define the time period]
- "Developmental research" (more applied, near- to medium-term) [Please define the time period]

6. Have these proportions changed over time? Why? What are the pros and cons of this?

Impact on HQP — Issue 2

7. Have any top-quality researchers been attracted to Canada largely (or in part) because of your network? Who and how many?

8. Have any top-quality Canadian researchers stayed in Canada because of your network? Who and how many?

9. Are there differences in the training received by graduate students and postdoctoral fellows through the network, compared to those trained through other research groups:? If so, why and how?

- Overall quality of training
- Exposure to user needs
- Experience in research training or management
- Experience with state-of-the-art equipment
- Professional contacts and networking
- Prestige and career

10. Has your network instituted any innovative ways of training graduate students and postdoctoral fellows; e.g., network-industry positions, internships, "work experience" programs, etc.? How many people have taken such training? What has been the result?

11. Is there any difference in the subsequent employment patterns of NCE-trained students and fellows compared to other graduates?

12. What methods have you used to increase the technical capability of the staff and officials of network partners and other research users? What has been the result (e.g., how many people were affected, and how)?

Degree of Network Management — Issue 3

13. Please describe the mechanisms your network uses for managing the research:

- Selecting major research themes that cover the fields necessary to achieve success for the NCE and network goals
- Selecting and funding individual projects that are well-integrated within those themes
- Allocating or changing support to individual projects

How successful have these mechanisms been? What improvements can be made?

14. Please describe the mechanisms your network uses for ensuring the research is relevant to external users:

- Attracting and assessing non-university partners
- Obtaining input from non-university partners into the research program
- Obtaining input from non-university partners into other network operations
- Identifying research results with potential for economic and social benefits to Canada

How successful have these mechanisms been? What improvement can be made?

15. Please describe the mechanisms your network uses for fostering collaboration and ensuring adequate communications:

- Supporting collaboration among researchers, including those in different sectors
- Communicating within the network to researchers
- Communicating within the network to other partners
- Communicating outside the network to other parties (e.g., government, the public) Who?

How successful have these mechanisms been? What improvements can be made?

16. Is the current degree of network management appropriate? What would you change if you could?

Impact of Network Management and Management Styles — Issue 6

17. What impact has the external partners' input had on the network's research or progress? Has the influence of external partners changed over the network's history? In what ways?

18. What evidence is there that collaboration and networking have increased?

19. Overall, what do you consider to be the most effective aspects (i.e., with respect to achieving NCE program goals) of your network's management structure? What are the least effective?

20. What impact has the 10% carry-over policy had on your network's finances? Has your network adhered to it? Do you think this rule is appropriate? How would your activities have differed — if at all — without this rule?

21. Is your network incorporated? What factors did you use to make this decision (in either direction)? What have been the pros and cons?

Exchange of Research Results and Technology Transfer — Issue 4 (see supplementary guide)

Program Design and Reorientation Issues — Issues 5 and 9

22. Are the current Phase II program goals appropriate for your network? For instance, to what extent are they understood and accepted by your researchers? By your partners? Do network participants share the same goals as federal program managers?

23. How have the changes in NCE program goals and policies between Phase I and Phase II affected your network? For example, have there been any changes in attitude of the various network participants over time as to the appropriateness or effectiveness of the NCE program goals and design? Have there been changes in their willingness to participate in the network? Has there been a shift in the focus of the research (e.g., short-term versus long-term)?

24. Is the NCE program design as a whole appropriate to achieve its goals? If not, what changes should be made?

25. What impacts have resulted from the uncertainty in program funding?

26. What impacts have there been on the network and its development from the program time frames:

- grant periods
- competition cycles

27. Overall, does the NCE program fill a useful niche in the spectrum of research support programs? Or does it duplicate existing programs?

Federal NCE Program Management Issues — Issue 7

28. Overall, how would you rate the effectiveness and competence of the NCE program management by the federal government? What impacts has this federal management had on your network — pros and cons?

29. What changes — if any — would be useful in the NCE federal program management?

30. Could this network exist on its own without the federal program management, if it had equivalent federal funding? What would be the advantages and disadvantages of this? Could it exist is some fashion without federal funding?

31. How has the joint management structure of NCE through the granting councils and Industry Canada affected program management? For example, is there consistency in operation among the three councils?

Impact of External Factors on Network and NCE Success — Issue 8 (note that receptor capability is discussed in the supplementary guide)

32. Besides receptor capability, are there other aspects of your industry, government, and hospital partners that affect your ability to apply network research results?

33. How much support has your network had from its university partners? Has this changed?

34. Are there specific university policies (e.g., for IP, teaching, financial management, technology transfer, confidentiality, etc.) that have affected the success or operation of your network? Of the NCE as a whole?

35. Have university policies changed over time because of the network?

36. What other external factors affected the success of your network or the program as a whole?

Partnerships

37. What impact has the network had on the creation of partnerships among university researchers?

38. What impact has the network had on the creation of partnerships between university researchers and non-university partners?

39. Have there been any changes in attitude towards collaborative research efforts over time? Please give examples.

- Among university researchers
- Among external partners

40. Have there been any changes in attitude towards applied research efforts by university researchers over time? Please give examples.

- Among university researchers
- Among external partners

Summary Comments

41. Do you have any general comments about the NCE or your network?

Other General Contacts

42. Interviewer: Confirm that the network has provided the list of contacts for:

- university VPs of Research and Industry Liaison officers
- partner and client contacts
- external partners that ideally **should** be involved but are not?

Thank You!

Interview Guide for Scientific and Network Directors:

New Networks

Background

Name: ______________________

Phone: ______________________

Fax: ______________________

Network: ______________________

Preliminary Discussion

In all questions below, we are particularly interested in the value added by the NCE approach to science and technology transfer — what impacts may there be that would not have occurred without the existence of the program? In addition, we are interested in the factors that may influence the success of your network, and the consequences of the reorientation of NCE goals and policies for Phase II.

Quality and Relevance of the Network Research — Issue 1

1. How will the network affect the scientific nature of research being carried out? Especially, how does NCE research differ from that supported by other sources? (If possible describe any impacts you observed while preparing the NCE proposal, or any impacts to date.)

- Scientific merit
- Balance of conservative versus risky research
- Multidisciplinarity
- Balance of fundamental versus applied research
- Quantity

2. Do you think there will be specific network research results that would not have occurred in the same time span, with the same funding, without the network structure?

Impact on HQP — Issue 2

3. Does your network plan to institute any innovative ways of training graduate students and postdoctoral fellows; e.g., network-industry positions, internships, "work experience" programs, etc.?

4. Have you planned any ways of increasing the technical capability of the staff and officials of network partners?

Degree of Network Management — Issue 3

5. Please describe the mechanisms your network intends to use for managing the research:

- Selecting major research themes that cover the fields necessary to achieve success for the NCE and network goals
- Selecting and funding individual projects that are well-integrated within those themes
- Allocating or changing support to individual projects

How successful have these mechanisms been so far? What improvements can be made?

6. Please describe the mechanisms your network intends to use for ensuring the research is relevant to external users:

- Attracting and assessing non-university partners
- Obtaining input from non-university partners into the research program
- Obtaining input from non-university partners into other network operations
- Identifying research results with potential for economic and social benefits to Canada

How successful have these mechanisms been so far? What improvement can be made?

7. Please describe the mechanisms your network intends to use for fostering collaboration and ensuring adequate communications:

- Supporting collaboration among researchers, including those in different sectors
- Communicating within the network to researchers
- Communicating within the network to other partners
- Communicating outside the network to other parties (e.g., government, the public) Who?

How successful have these mechanisms been so far? What improvement can be made?

8. What impact has the external partners' input had on the network's research program?

9. Roughly what proportion of your network's research will be:

- "Discovery research" (fundamental, long-term)
- "Developmental research" (more applied, near- to medium-term)

Exchange of Research Results and Technology Transfer — Issue 4

10. In general, what are the most important social and economic impacts likely to be from your network?

    - For Canada
    - For your partners

Program Design and Reorientation Issues — Issues 5 and 9

11. Are the current Phase II program goals appropriate for your network? For instance, are they understood and accepted by your researchers? By your partners? Do network participants share the same goals as federal program managers?

12. Is the NCE program design as a whole appropriate to achieve its goals? If not, what changes should be made?

13. Overall, does the NCE program fill a useful niche in the spectrum of research support programs? Or does it duplicate existing programs?

Federal NCE Program Management Issues — Issue 7

14. Overall, how would you rate the effectiveness and competence of the NCE program management by the federal government for achieving program goals? What impact has this federal management had on your network — pros and cons?

15. How useful was federal program management in helping you set up your network? How useful were the existing networks?

16. What changes — if any — would be useful in the NCE federal program management?

17. How has the joint management structure of NCE through the granting councils and Industry Canada affected program management? For example, is there consistency in operation among the three councils?

Impact of External Factors on Network and NCE Success — Issue 8

18. What receptor capability is there among your network's Canadian partners? How do you know?

19. If Canadian receptor capability is weak, what actions will the network take as a result?

20. Besides receptor capability, are there other aspects of your industry, government, and hospital partners that will affect your ability to apply network research results?

21. How much support has your network had from its university partners so far?

22. Are there specific university policies (e.g., for IP, teaching, financial management, technology transfer, confidentiality, etc.) that have affected the creation of your network?

23. What other external factors are likely to affect the success of your network or the program as a whole?

Partnerships

24. What impact has the network had so far on the creation of partnerships among university researchers?

25. What impact has the network had so far on the creation of partnerships between university researchers and external partners?

Summary Comments

26. Do you have any other comments on your network or the program as a whole?

Interview Guide for Scientific and Network Directors:

Non-Renewed Networks — General Information

Background

Name: ______________________________

Phone: ______________________________

Fax: ______________________________

Network: __________________________

Preliminary Discussion

In all questions below, we are particularly interested in the value added by the NCE approach to science and technology transfer — what impacts were there that would not have occurred without the existence of the program? Where appropriate, please give detailed examples of effects you observed at your own network, or in the program as a whole. In addition, we are interested in the factors that influenced the success of your network, and any continuing impacts that may have occurred after your network terminated.

Quality and Relevance of the Network Research — Issue 1

1. How did the network affect the scientific nature of research being carried out by network researchers? Especially, how did NCE research differ from that supported by other funding sources?

   Scientific merit
   Balance of conservative versus risky research
   Multidisciplinarity
   Balance of fundamental versus applied research
   Quantity

2. How did the network research compare to international standards of excellence? If high: Were there any specific measures that support this belief?

3. Do you think there were specific network research results that would not have occurred in the same time span, with the same funding, without the network structure? Which? Why?

4. How did overall network research productivity compare to that of non-NCE university research? If your believe there were differences, what evidence is there?

5. Roughly what proportion of your network's research was:

- "Discovery research" (fundamental, long-term) [Please define the time period]
- "Developmental research" (more applied, near- to medium-term) [Please define the time period]

6. Did these proportions change over time? Why? What were the pros and cons of this?

Impact on HQP — Issue 2

7. Were any top-quality researchers attracted to Canada largely (or in part) because of your network? Who and how many?

8. Have any top-quality Canadian researchers left Canada because your network terminated? Who and how many?

9. Were there differences in the training received by graduate students and postdoctoral fellows through the network, compared to those trained through other research groups:? If so, why and how?

- Overall quality of training
- Exposure to user needs
- Experience in research training or management
- Experience with state-of-the-art equipment
- Professional contacts and networking
- Prestige and career

10. Did your network institute any innovative ways of training graduate students and postdoctoral fellows; e.g., network-industry positions, internships, "work experience" programs, etc.? How many people took such training? What was the result?

11. Was there any difference in the subsequent employment patterns of NCE-trained students and fellows compared to other graduates?

12. What methods did you use to increase the technical capability of the staff and officials of network partners and other research users? What was the result?

Degree of Network Management — Issue 3

13. How successful were the mechanisms your network used for managing the research? What improvements would you suggest for Phase II networks?

14. How successful were the mechanisms your network used for ensuring the research was relevant to external users? What improvements would you suggest for Phase II networks?

15. How successful were the mechanisms your network used for fostering collaboration and ensuring adequate communications? What improvements would you suggest for Phase II networks?

16. Was the overall degree of network management appropriate? What would you suggest for Phase II networks?

Impact of Network Management and Management Styles — Issue 6

17. What impact did the external partners' input had on the network's research or progress? Did the influence of external partners changed over the network's history? In what ways?

18. What evidence was there that collaboration and networking increased due to the network?

19. Overall, what do you consider were the most effective aspects (i.e., with respect to achieving NCE program goals) of your network's management structure? What were the least effective?

20. Was your network incorporated? What factors did you use to make this decision (in either direction)? What were the pros and cons?

Exchange of Research Results and Technology Transfer — Issue 4 (see supplementary guide)

Program Design and Reorientation Issues — Issues 5 and 9

21. Do you believe the Phase II program goals are appropriate for researchers in your area?

22. Are the Phase II goals and policies appropriate for potential external partners in your area?

23. Is the NCE program design as a whole appropriate to achieve its goals? If not, what changes should be made?

24. Overall, does the NCE program fill a useful niche in the spectrum of research support programs? Or does it duplicate existing programs?

Federal NCE Program Management Issues — Issue 7

25. Overall, how would you rate the effectiveness and competence of the NCE program management by the federal government? What impacts did this federal management had on your network — pros and cons?

26. What changes — if any — would be useful in the NCE federal program management?

27. How did the joint management structure of NCE through the granting councils and Industry Canada affect program management? For example, was there consistency in operation among the three councils?

28. Did any components of your network survive once federal funding and management ended? Please describe.

Impact of External Factors on Network and NCE Success — Issue 8 (note that receptor capability is discussed in the supplementary guide)

29. Besides receptor capability, were there other aspects of your industry, government, or hospital partners that affected your ability to apply network research results?

30. How much support did your network have from its university partners?

31. Were there specific university policies (e.g., for IP, teaching, financial management, technology transfer, confidentiality, etc.) that affected the success or operation of your network? Of the NCE as a whole?

32. Did university policies change over time because of the network?

33. What other external factors affected the success of your network or the program as a whole?

Partnerships

34. What impact did the network have on creating partnerships among university researchers that lasted after the network ended?

35. What impact did the network have on creating partnerships between university researchers and non-university partners that lasted after the network ended?

36. Did the network or the NCE program cause any changes in attitude towards collaborative research efforts over time? Please give examples.

- Among university researchers
- Among external partners

37. Did the network or the NCE program cause any changes in attitude towards applied research efforts by university researchers over time? Please give examples.

- Among university researchers
- Among external partners

38. What effect did these partnerships had on the nature or quality of network research?

Other General Contacts

39. Interviewer: Confirm that the network has provided the list of contacts for:

- university VPs of Research and Industry Liaison officers
- partner and client contacts
- external partners that ideally **should** have been involved but were not?

40. Do you have any general comments about the NCE or your network?

Supplementary Interview Guide for Scientific and Network Directors:

Renewed and Non-Renewed Networks — Social and Economic Impacts: Evaluation Issue 5

This guide is intended to obtain more detailed information on possible impacts related to the NCE goal to facilitate technology transfer for Canadian social and economic development. Some of this information is already available from the network's Annual Report and/or the annual appendix tables — in these cases we will confirm our understanding of these impacts and, where appropriate, ask for more detail.

Mechanisms for Technology Transfer

1. In general, what are the most important social and economic impacts likely to be from your network?
    - For Canada
    - For your partners

2. In general, please describe your network's mechanisms for
    - Identifying research results with commercial or social potential
    - Disseminating important research results to network partners
    - Facilitating the receptor capability of partners to understand and use the results
    - Formally or informally transferring the technology to partners or other users
    - Maximizing the value added for Canada and Canadian organizations

3. What specific steps has your network taken to try to maximize eventual benefits to Canada and Canadian firms, as opposed to foreign firms or other organizations?

4. Please describe any "arm's length corporations set up to add value to network research. What are the pros and cons of such an approach?

5. Has your network negotiated any agreements that will result in financial returns to the network or partner universities in exchange for access to IP (e.g., licenses, royalty agreements, equity positions in spin-off companies or new areas in existing companies)?

6. What have been the main challenges in IP negotiations, and how have you resolved them?

7. How does the amount and rate of technology transfer compare to that from non-NCE university research?

General Socio-Economic Impacts

Since there are a variety of impacts that different networks have experienced, the questions below may have accidentally neglected some that pertain to your network. Please correct us in any such case. **In all cases please distinguish between Canadian versus foreign impacts.**

7. Which of the following have occurred **due to your network**? (Describe all that apply.)

- ☐ Influencing the policies or regulations of government agencies — e.g., influencing the regulatory approach to clinical trials, or changing the nature of assistance programs to high technology companies.
- ☐ Influencing the research capability or focus of Canadian universities in user-relevant areas — e.g., through creation of research institutes in applied fields that are similar to network topics.
- ☐ Influencing the policies or regulations of hospitals or other health care organizations — e.g., changing the training of medical staff.
- ☐ Influencing the policies or regulations of industry — e.g., with respect to attitudes towards the elderly
- ☐ Influencing the R&D topics addressed by partner companies in the private sector — e.g., influencing what core areas your partner companies focus on in their internal R&D operations.
- ☐ Influencing the R&D capability of partner companies in the private sector — e.g., through access to highly-qualified people, or through significant improvements in the capability of existing staff.
- ☐ Influencing the creation of Canadian industrial or health care consortia or other working partnerships.
- ☐ Influencing foreign companies to initiate or expand their Canadian R&D or manufacturing operations. (Please describe under what conditions.)

Impacts Related to Possible New Products, Processes, or Services

8. Which of the following have occurred **due to your network**? Please describe.

- ☐ Patents, licenses, or other intellectual property protection being applied for (Interviewer: confirm "appendix table" material")
- ☐ Further R&D investments being made by your network in new companies or new areas for existing companies
- ☐ Further R&D investments being made by the private sector or the investment community — e.g., through investment of seed capital in new companies or new areas for existing companies
- ☐ Specific new products, processes, or services being actively under development by partners
- ☐ Demonstration projects of promising new network technology, feasibility testing under field conditions, etc.
- ☐ Likely practical application of network research results in the near future — e.g., products, processes, or services being brought to market following successful trials, demonstrations, etc.
- ☐ Actual practical application of network research results — e.g., products, processes, or services brought to market already.
- ☐ Actual increases to partner revenues as a result of being part of the network — e.g., through product/service sales, or through sales in related fields that occurred because of the network connection, or through cost savings
- ☐ Other. What? _______________

Impacts Related to Potential Health Impacts

9. Which of the following health-related impacts have occurred or are highly likely to occur **due to your network?**

    - ☐ Results that are likely to result in improvements to medical diagnoses
    - ☐ Improved identification of disease causes or predisposing factors
    - ☐ Improved identification of disease risk factors
    - ☐ Improved medical equipment
    - ☐ Improved disease treatments
    - ☐ Improved disease prevention, or increased levels of general health
    - ☐ Reduced cost of treatments
    - ☐ Improved health care systems

Impacts Related to Potential Social Impacts

10. Which of the following other types of social impacts have occurred or are highly likely to occur due to the network?

    - ☐ Improved quality of education
    - ☐ Improved quality of life for Canadians in general, or special needs groups (e.g., the young, the elderly)
    - ☐ Reduced environmental impacts
    - ☐ Other. What? ____________________

Interview Guide for Board of Directors:

Renewed Networks

Background

1. Name: ______________________________

Phone: ______________________________

Fax: ______________________________

Network: __________________________

Preliminary Discussion

In all questions below, we are particularly interested in the value added by the NCE approach to science and technology transfer — what impacts are there that would not have occurred without the existence of the program? Where appropriate, please give detailed examples of effects you have observed at your own network, or in the program as a whole.

Overall Impressions

2. First, please give me your overall impressions of this network.

Quality and Relevance of the Network Research

3. Overall, how has the network affected the scientific nature of research being carried out? Especially, how does NCE research differ from that supported by other sources?

   - Scientific merit
   - Balance of conservative versus risky research
   - Multidisciplinarity
   - Balance of fundamental versus applied research
   - Quantity

4. Do you think there are specific network research results that would not have occurred in the same time span, with the same funding, without the network structure?

5. How did overall research productivity compare to that of non-NCE university research?

6. How effective has the network been at focusing on research that is relevant to its external partners?

Impact on HQP

7. Has the network had any impact on the supply of highly-qualified people within Canada, compared to the "normal" means of support to graduate students and postdoctoral fellows?

Network Management Issues

8. How effective has your network's management been at:
   - Selecting major research themes
   - Selecting and funding individual projects that are well-integrated within those themes
   - Ensuring relevance to providing economic and social benefits to Canada
   - Obtaining external participation
   - Reviewing the progress of individual projects and themes, and revising funding
   - Communicating to researchers
   - Communicating to external partners

9. How much external participation is there from network partners (e.g., university representatives, industry, health care providers, government)?
   - Planning the research program
   - Carrying out the research
   - Reviewing network progress
   - Identifying research results that may have economic or social importance

10. What impact have the external partners had on the network's research or progress?

11. Has the influence of external partners changed over the network's history?

12. Is your network incorporated? What have been the pros and cons?

Program Design Issues

13. Are the current Phase II program goals appropriate for your network? For instance, are they understood and accepted by the researchers? By the partners? Are they appropriate for the partners in your sector?

14. How have the changes in NCE program goals and policies between Phase I and Phase II affected your network: e.g., have there been changes in attitude of the various network participants as to the appropriateness or effectiveness of the NCE program goals and design? Have there been changes in their willingness to participate in the network?

15. As a whole, is the NCE program design appropriate to achieve its goals? If not, what changes should be made?

16. Overall, does the NCE program fill a useful niche in the spectrum of research support programs? Or does it duplicate existing programs?

NCE Program Management Issues

17. Overall, how would you rate the NCE program management?

Impact of External Factors on Network and NCE Success

18. What receptor capability is there among your network's Canadian partners?
19. If receptor capability is weak, what actions has the network taken to try to improve it? How effective have they been?
20. What support has your network had from its university partners? Has this changed over time?
21. Are there specific university policies (e.g., for IP, teaching, confidentiality, technology transfer, etc.) that have affected the success of your network? Of the NCE as a whole?
22. Have university policies changed over time because of the network?

Collaborative Partnerships

23. What impact has the network had on the creation of true collaborative partnerships among university researchers for:
    - planning the research
    - carrying out the work
    - using research results:
24. What impact has the network had on the creation of true collaborative partnerships between university researchers and external partners for:
    - planning the research
    - carrying out the work
    - using research results:

Technology Transfer

25. How effective has your network been at technology transfer to its partners? Please describe specific methods and instances, for example:
    - Identifying research results with large commercial or social potential
    - Disseminating important research results to network partners
    - Ensuring partners have the receptor capability to understand and use the results
    - Formally or informally transferring the technology to partners
    - Maximizing the value added for Canada and Canadian organizations
26. How did the amount and rate of technology transfer compare to that from non-NCE university research?
27. What barriers exist to successful technology transfer? Can the program or network address these?

Summary Comments

28. Do you have anything to add?

Interview Guide for NCE Non-Participants:

Background

Name: ____________________________

Phone: ____________________________

Fax: ____________________________

Network: ________________________

Preliminary Discussion

As part of our evaluation of the Networks of Centres of Excellence (NCE) program, we are contacting various people in relevant organizations that are not directly involved with the networks. You were suggested as a possible respondent by one or more NCE participants. Essentially we are interested in why you are not involved.

Awareness And Over Impressions

1. First, please tell me about any involvement your organization has had with this network or the NCE program as a whole.
2. How familiar are you with this network? How familiar are you with the NCE program?
3. What are your overall impressions of this network?
4. What are you overall impressions of the NCE program?

Possible Future Involvement

5. Has the network suggested more involvement for your organization that it has had so far? If so, what kind of involvement?
6. What are the pros and cons of becoming more involved?

- Pros:

- Cons:

7. What factors were most important in making your decision about whether to become involved?

8. What would have to change for you to become more involved?

- Changes in the network:

- Changes in the NCE program

9. Overall, does the NCE program fill a useful niche in the spectrum of research support programs? Or does it duplicate existing programs?

Summary Comments

10. Do you have anything to add that was not covered above about

- NCE program objectives
- The objectives of this network
- The management of this network
- The likely impacts of this network for your organization

Interview Guide for Federal Program Officers

Background

Name: ______________________________

Phone: ______________________________

Fax: ______________________________

Network: __________________________

Degree of Network Management — Issue 3

1. How effective are the mechanisms this network uses for managing the research:

- Selecting major research themes that cover the fields necessary to achieve success for the NCE and network goals
- Selecting and funding individual projects that are well-integrated within those themes
- Allocating or changing support to individual projects

What improvements can be made?

2. How effective are the mechanisms this network uses for ensuring the research is relevant to external users:

- Attracting and assessing non-university partners
- Obtaining input from non-university partners into the research program
- Obtaining input from non-university partners into other network operations
- Identifying research results with potential for economic and social benefits to Canada

What improvement can be made?

3. How effective are the mechanisms this network uses for fostering collaboration and ensuring adequate communications:

- Supporting collaboration among researchers, including those in different sectors
- Communicating within the network to researchers
- Communicating within the network to other partners
- Communicating outside the network to other parties (e.g., government, the public) Who?

What improvements can be made?

4. Is the current degree of network management appropriate? What would you change if you could?

5. How effective has this network been at financial management?

6. What impact has the 10% carry-over policy had on this network's finances? Has this network adhered to it?

Impact of Network Management and Management Styles — Issue 6

7. Overall, what do you consider to be the most effective aspects (i.e., with respect to achieving NCE program goals) of this network's management structure? What are the least effective?

8. From your experience with a variety of networks, what appears to be the most effective management styles? What are the least effective? Please give examples from individual networks.

9. What have been the pros and cons of network incorporation?

Program Design and Reorientation Issues — Issues 5 and 9

10. Are all four of the current Phase II program goals appropriate for this network? Are they appropriate for all its partners?

11. Are the goals of this network consistent with those of the NCE program? If not, why, and why was this network selected?

12. Do network participants share the same goals as federal program management? If not, why?

13. How have the changes in NCE program goals and policies between Phase I and Phase II affected this network? For example, have there been any changes in attitude of the various network participants over time as to the appropriateness or effectiveness of the NCE program goals and design? Have there been changes in their willingness to participate in the network? Has there been a shift in the focus of the research (e.g., short-term versus long-term)?

14. Is the NCE program design as a whole appropriate to achieve its goals? If not, what changes should be made?

15. What impacts have there been on the network and its development from the program time frames:

- grant periods
- competition cycles

Federal NCE Program Management Issues — Issue 7

16. What are the main challenges for federal program management? How have these been addressed?

17. How effective is the federal management system?

- For ensuring financial accountability for individual networks
- For ensuring overall program financial accountability
- For monitoring the progress of networks against their objectives and NCE objectives
- For monitoring the progress of the program overall against its objectives

18. What changes — if any — would be useful in the NCE federal program management?

19. How has the joint management structure of NCE through the granting councils and Industry Canada affected program management? For example, is there consistency in operation among the three councils?

General Comments

20. Do you have any general comments about the NCE or this network?

ARA

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Date:
To:
From:
Project No:
Fax Number:
No of Pages (including cover)

Subject: **Interview Guide For Social Impacts and/or Health Care Benefits Case Study — Industry Partners**

Your remarks will be included in case studies provided to the NCE directorate, but comments will not be attributed to individual respondents

First I will be asking you some questions about the attached sheet which discusses rough estimates of benefits from network projects leading to health care improvements or social impacts. These questions will be for the purpose of expanding or clarifying some of the information provided.

Then I will be asking you the following questions.

1. What was the role of your network in this project?
   - In achieving successful research results?
   - In protecting Intellectual Property?
   - In establishing or participating in discussions with producers or users of the research?
2. How much of this work would have been done if the network didn't exist? For example, would somebody else have done it, or would it have taken longer?
3. What is your overall opinion of the network?
4. What are the most significant pros and cons of being involved?
5. What is your opinion of the NCE program as a whole?
6. Have you participated in any of the network boards or committees? If so, which ones? What has your experience been in these activities?
7. How relevant and useful is the network research likely to be for your organization? (If appropriate, please consider projects other than the specific one we have been discussing.)

If you have any problems receiving this transmission, call Kim Ocampo at (604) 681-7577

8. Has the network had any impact on training people that your organization has hired (or will hire in the future)?
9. Has the network had any impact on increasing your own organization's technical capability?
10. Do you have any suggestions for improvements to the network or the NCE program as a whole?

Interview Guide for Collaboration and Impacts Case Study

All replies will be kept strictly confidential by ARA and results will only be presented in aggregate form. The NCE and/or your network will not have access to your individual responses.

Background

Name: ______________________________
Phone: ______________________________
Fax: ______________________________

Network ______________________________
Group (Theme) ______________________
Project ______________________________

Position of respondent in network ______________________________

1. We'd like to get a general picture of who and where the principal investigators on your project are. Can you tell me how many investigators there are, where they are located, and which sectors they represent?

2. What was your relationship with each of your major collaborators on this project before the network started?

   Number of people

   ____ Did not know at all previously
   ____ Had met before, but had not worked with
   ____ Had previous low level collaboration with (e.g. exchange of results)
   ____ Full previous collaboration (e.g. shared project)
   ____ Other. What?

Value Added of Collaboration

3. In these case studies, I'm particularly interested in the nature and value of the collaboration supported by the NCE. I have a number of specific questions, but first perhaps you could tell me how you feel overall about the collaboration.

4. What are the major reasons you decided to enter the NCE collaboration? (For industrial partners, what technology transfer was expected?)

---

5. How was your research changed by the collaborative aspects of the program?
   Main benefits
   Main drawbacks

Nature of Collaboration

6. Did the principal members of your team operate as a true collaborative unit (e.g., with common research goals, input from all participants in planning and carrying out the research, good communications among team members, etc.)?

7. Please describe the nature and frequency of the collaboration **within your project.** (Include major collaborative activities such as planning meetings, joint research efforts, exchanges of information or materials, and so on.)

8. Did you have any significant collaboration with other members of **your network**? If yes, please describe the nature and frequency of the collaboration.

9. What was the relative degree of collaboration with **other sectors** (e.g., with government or industry if you are in academia, or academia or government if you are in industry)

10. What was the role within the collaboration of senior investigators, versus postdoctoral fellows and graduate students? Was this appropriate?

Impacts on Applications

11. Are there any results of your project likely to have significant economic or social impacts in the near to medium future? Please describe. (If so, could you please give me the names of appropriate contacts at user organizations.)

12. Has your involvement with the NCE and this network had any influence on:

- Your attitude towards collaborative research with other researchers in your sector

- Your attitude towards applied research

Interdisciplinarity

1. Would you describe your project as interdisciplinary? Was this useful and important? (What disciplines does it include? Are these sub-disciplines of one main area or are they different disciplines entirely?

Program Success

2. If you were starting such a collaboration now, is there anything you would do differently?

3. What advice about collaboration would you give to a colleague just beginning such a project?

4. What is your overall opinion of your network and the NCE Program?
5. What changes, if any, would you like to see in your network or the program?
6. Do you have any final comments about the NCE?

Interview Guide For Social and/or Health Care Benefit Case Study — External Experts on both the Research and Likely Impacts of NCE Project

Thank you for agreeing to help us with the evaluation of the Networks of Centres of Excellence (NCE) program. We are interested in putting the results of specific NCE research projects into context. Any insights you can give us on the research or its possible impacts would be appreciated — for example, how the NCE work fits into the Canadian and international research scene, the likely importance of any practical impacts, and so on. **Your remarks will be included in case studies provided to the NCE directorate, but comments will not be attributed to individual respondents**

Comments on the Research

1. Could you give me your overall impression on the research done in this project?
2. How good is this research?
3. How important is this research? For example: is the topic important; how does this research fit into the Canadian and international research scene; is it unique or does it employ a unique approach; is it derivative; are there many competing groups; etc.
4. Can you estimate how much of this work would have been done if the network weren't around? (e.g., have other people been doing similar work, is there a lot of competition in the same field, would it have taken longer, etc.)

Comments on Practical Applications

1. Could you give me your overall impression of the possible practical applications of this research?
2. How likely do you think it is that the results will be applied in a practical way?
3. Is the project really going to have the nature and size of impacts the network says it will? For example, are there significant hurdles to overcome before application can occur, will the results be used in the anticipated manner, etc.
4. How important are these impacts likely to be? For example: is the topic important; will many people be affected and to what degree; are there many competing technologies; etc.
5. Do you think this application would have occurred if the network didn't exist? (e.g., have other people been doing similar work, is there a lot of competition in the same field or are there other ways of achieving the same impacts, would it have taken longer to be applied?)
6. Do you have any other comments on this projects or its applications?

Networks of Centres of Excellence: Interview Guide for V-Ps Research and Industry Liaison Officers

Please note that all responses will be held confidential by the ARA Group. No individuals will be identified in any reporting.

Background

Name: ______________________________

Position: ______________________________

Phone: ______________________________

Fax: ______________________________

Preliminary Discussion

In all questions below, we are particularly interested in the interaction between your office and the networks. In addition, any comments you have on the value added by the NCE approach to science and technology transfer, or on the impacts of the program's reorientation for Phase II, would be appreciated.

Overall Impressions

1. First, please give me your overall impressions of the NCE program and the networks.

Impacts on the VP-Research and/or UILO Offices

2. Please describe your participation in technology transfer from network research. What have the challenges been for your office? How have they been solved?
3. Are there specific NCE or network policies (e.g., for overhead, intellectual property, teaching, technology transfer, confidentiality, etc.) that have affected the university or your office?
4. How effective have the networks been at technology transfer to their partners? How does this compare to technology transfer from non-NCE university research?

Quality and Relevance of the Network Research — Issue 1

5. Do you think the networks have affected the scientific nature of research being carried out? Especially, how does NCE research differ from that supported by other sources?

Impact on Highly Qualified Personnel — Issue 2

6. Have there been differences in the training received by graduate students and postdoctoral fellows through the network, compared to those trained through other research groups?

7. Have the networks affected the technical capability of the staff and officials of network partners and other research users?

Network Management Issues — Issue 3

8. How effective have your networks been at managing their research programs?

9. What are the pros and cons for your university of networks incorporating?

Program Design and Reorientation Issues — Issues 5 and 9

10. Are the current Phase II NCE program goals appropriate?

11. What were the impacts of the changes in NCE program goals and policies between Phase I and Phase II?

12. As a whole, is the NCE program design appropriate to achieve its goals? If not, what changes should be made?

13. Overall, does the NCE program fill a useful niche in the spectrum of research support programs? Or does it duplicate existing programs?

Summary Comments

14. Do you have anything to add about the networks or the NCE program as a whole?

IG-VP-SH.DOC

APPENDIX P

SELECTED NETWORK TECHNOLOGY TRANSFER MECHANISMS AND STRUCTURES

Exhibit P1: Selected Network Technology Transfer Mechanisms and Structures

CBDN	Plans for Canadian Microbiology Consortium Inc. (CMCI) with common Board of Directors, but separate management committees with some overlap of members. Issues related to links between researchers and users, IP issues in Internal Agreement noted by Selection committee for Phase II. High cash and in-kind contribution from current partners, especially industry (total of $6m cash and in-kind from industry is higher than NCE funding). Proposed external peer and industrial review of research program. Eight spin-off companies (e.g., SPI diagnostics, SEMGEN, PhageScreen, MicroExpress Biotech), and many examples of industrial product development. At least $16m in private placements by affiliated companies; four products on market and 9 in development.
CGDN	Network played key role in creation of the Centre for Molecular Medicine and Therapeutics (CMMT) at UBC, with funding of: • Merck-Frosst $15 m • UBC $8-10 m for salaries • BC 21 Fund $9 m for infrastructure • Land from Vancouver city and BC Children's' Hospital worth $5m • Expect 120 HQP jobs + 30 staff, to grow to 200 Shift of focus to more common diseases (but multi-gene) to increase impacts. Recently hired a Commercial Director. Established "corporate entities" to commercialize research and return $ to CGDN: Apoptogen inc. (Ottawa), Alzheimer's Canada Inc. (Toronto), and Neurovir Inc. (Vancouver). Commercial funding secured for Apoptogen, being finalized for Neurovir, with a diagnostic pharmaceutical collaboration being developed for Alzheimer's Canada. A new Montreal venture (Sequana Canada) is being planned. There is a network "Strategic Fund" to provide top-up funding for projects with strong commercial potential. Returns to CGDN through equity partnerships, royalties.
CITR	Complementary with TRIO of Ontario Centres of Excellence Program; the ITRC of Ontario, and has involvement of NRC and CRC, plus new alliance with the Advanced Satellite Communications program of federal government. CITR has identified service providers and suppliers, and industrial affiliates are involved heavily in planning research program. There are "industrial co-leaders" in each Major Project. Selection Committee believes end user involvement could be increased.
Concrete	Active participation of academia, government, and industry. Huge Industrial Advisory and Implementation Board. "Practitioners" are active as researchers and industrial advisors to ensure relevance. Selection Committee commented on good analysis of barriers to new technology in conservative sector: ties to government (including international) wrt regulatory concerns (materials, testing, design), end users wrt engineering and design issues. Carries out demo projects and advice (e.g., Hibernia, PEI bridge) New export markets developed by industry partners in US, Japan, and Europe. Provision of better consulting services by private sector also a possible Canadian benefit.

	Now have "Collaborating Investigators" in addition to PIs (some from industry, some from universities).
HEALNet (new)	Information-based decision tools will improve health care, productivity in workplace, cost savings, policy decision aids, plus can market tools and services. Good network of disciplines, academic, public, and commercial partners, including in planning. High corporate commitment and involvement. HQP training based on existing successful continuing education models.
IRIS	Main interface with providers, users may benefit from more interactions Strong link to PRECARN (industrial pre-competitive research consortium) — IRIS may feed research ideas to PRECARN — and many common researchers. However, new companies have joined that are not part of PRECARN. Recent RFPs to all relevant researchers in Canada (i.e., not just those in IRIS) to submit exploitation proposals intended to maximize industrial payoffs.
ISIS (new)	Benefits will come through cost savings to structures, HQP training; possibly become world leader in area, generate jobs and products, services. Technical Resources Centre planned to provide students with opportunities to work with industry and government on demo projects.
Inspiraplex	Industrial receptor capability weak; network will encourage multinationals to establish subsidiaries in Canada (similar to NeuroScience), and strategic alliances among Canadian SMEs. Will establish own for-profit technology development company — Inspiration R&D Inc. Contract researchers to McGill to be eligible for federal and Quebec tax credits, free up resources for other matters; hope McGill will assign them rights to IP. Main benefits probably through health and cost savings, not industrial benefits
Mechanical Wood Pulps	Strong industrial involvement in the research. Interdisciplinary and well-integrated, with well-defined problems, strong ties to PAPRICAN and pulp and paper companies, and also now suppliers. Expect more funding from industry in future. Hired a technology transfer manager and have specific technology transfer. budget, and there is a Board marketing committee.
MICRONET	Precompetitive. Ties to Ontario Centres of Excellence High HQP supply to Canadian firms (85% of graduates employed in Canada). Strong CEO and industrial involvement in planning research, although not much funding. Technology transfer assistant has been hired. Technology transfer tends to be through contract research and/or NSERC Targeted Research Programs, plus HQP. Has a Co-op Program and an Industrial Internship Program for graduate students. Now have matching funds policies with some SMEs but this may be through NSERC UI programs.
NeuroScience	NeuroScience Fund to raise $100 m venture capital funds ($53m to date), with Royal Bank, Caisse de Dépôt, (MDS Health Ventures as General Partner and Fund manager) Few receptor companies in Canada, NS pushes to develop them, may help employ HQP; the Fund is intended to help, as well as internal management for "discovery development". Development of "critical mass of technologies" rather than individual discoveries, to attract venture capital and development capital.